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390,000 DWT TANKER

BUILDER:	Newport News Shipbuilding and Dry Dock Company
PURCHASER:	VLCC 1 Corporation
HULL NUMBERS:	Newport News - 613C and 614C
	Marad - 309 and 310
CONTRACT NUMBER:	MA/MSB-318

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1040-616	F	Transverse Oil Tight Bulkhead Frame 97
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1040-631	J	Horizontal Girder 3 Frame 61 30-3 Level
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1040-643	F	Horizontal Girder 3 Frame 101 30-3 Level
1040-644	B	Horizontal Girder 4 Frame 101 15-0 Level
1040-645	C	Horizontal Girder 1 Frame 105 69-0 Level
1040-646	C	Horizontal Girder 2 Frame 105 48-0 Level
1040-647	D	Horizontal Girder 3 Frame 105 30-3 Level
1040-648	D	Horizontal Girder 4 Frame 105 15-0 Level
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2212-5	B	Arrangement of Piping and Oper. Gear for Water Tight Horizontal Door, Bulkhead #23 Plan, Section, Elevation
2212-6	B	Arrangement of Piping and Oper. Gear for Water Tight Horizontal Door, Bulkhead #23 Plan, Section, Elevation List of Material
2280-676	A	Bilge System Focsle Spaces Arrangement
2280-677	C	Bilge System Focsle Spaces List of Material
2280-682	E	Pipe Arrangement Bilge and Ballast System Engine Room - Plan, Section and Elevation
2280-683	F	Piping Arrangement Bilge and Ballast System Engine Room - Plan, Section and Elevation - List of Material
2280-685	D	Piping Arrangement Inner Bottom Tanks Frames 23-58 Plan, Section and Elevation
2280-686	E	Piping Arrangement Inner Bottom Tanks Frames 23-58 L/M

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2280-688	F	Pipe Arrangement Bilge and Ballast Priming System in Engine Room
2280-689	E	Pipe Arrangement Bilge and Ballast Priming System in Engine Room List of Material
2280-691	F	Diagram Bilge and Ballast System Arrangement
2280-692	K	Diagram Bilge and Ballast System - List
2280-705	D	Piping Arrangement Boiler Washdown Plan, Section, Elevation
2280-706	D	Piping Arrangement Boiler Washdown Plan, Section, Elevation - List of Material
2280-708	F	Piping Arrangement Aft Ballast Tank Plan, Section
2280-709	E	Piping Arrangement Ballast Tank - Elevation - List of Material
2280-711	H	Piping Arrangement Miscellaneous Pl. DRains in Engine Room Plan, Section and Elevation
2280-712	H	Piping Arrangement Miscellaneous Pl. Drains in Engine Room List of Material
2280-714	B	Arrangement and L/M - Strainer Plates in Engine Room
2280-715	E	Piping Arrangement Oil/Water Separator for Bilge System in Engine Room - Plan, Section and Elevation
2280-716	E	Piping Arrangement Oil/Water Separator for Bilge System in Engine Room - List of Material
2280-720	G	Piping Arrangement Bilge and Oily Water System Upper Deck Frames 58-62
2280-721	J	Piping Arrangement Bilge and Oily Water System Upper Deck Frames 58-62 - List of Material
2283-700	F	Diagram Overflow AE and S.T.Arrangement
2283-701	C	Diagram Overflow AE and S.T.List
2283-702	F	Overflow AE and ST Aft Frame 58 Arrangement
2283-703	F	Overflow AE and ST Aft Frame 58 List of Material

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2283-705	F	Overflow AE and ST Forward Frame 58 Arrangement
2283-706	F	Overflow AE and ST Forward Frame 58 List of Material
2284-255	F	Pipe Arrangement Fuel Oil Fill Trans. System in Engine Room - Plan, Section and Elevation
2284-256	F	Pipe Arrangement Fuel Oil Fill and Trans. System in Engine Room - List of Material
2284-259	C	Arrangement - Fuel Oil Filling Station in Engine Room LL
2284-260	A	Arrangement - Fuel Oil Filling Station in Engine Room LL Pl,Section, Elevation
2287-144	C	Piping Arrangement Tanks Level Gages, Plan, Section and Elev.
2287-145	E	Piping Arrangement Tank Level Gage B/M
2302-55	D	Diagram Hydraulic Cont. System Arrangement
2302-56	C	Diagram Hydraulic Cont. System List
2302-57	E	Hydraulic System Cargo Valve Cont. in Tank Frames 58 85 Arr.
2302-58	F	Hydraulic System Cargo Valve Cont. in Tank Frame 58-85 L/M
2302-59	E	Hydraulic System Cargo Valve Cont. in Tank Fwd Fr. 85 Arr.
2302-60	D	Hydraulic System Cargo Valve Cont. in Tank Fwd. Fr. 85 L/M
2302-61	H	Hydraulic System Cargo Valve Cont. Upper Deck Aft Fr. 85 Arr.
2302-62	G	Hydraulic System Cargo Valve Cont. Upper Deck Aft Fr. 85 L/M
2302-65	D	Hydraulic System Cargo Valve Cont. Upper Deck Forward Fr. 85 Arrangement
2302-66	E	Hydraulic System Cargo Valve Cont. Upper Deck Forward Fr. 85 List of Material
2302-70	E	Hydraulic System Cargo Valve Control Cargo Pump Room Lower Level
2302-71	F	Hydraulic System Cargo Valve Control Carco Pump Room Lower Level - L/M

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2302-93	A	Piping Hydraulic Power Pack in Machinery Space - Arrangement List of Material
2350-1342	E	Diagram Potable Water System
2350-1343	B	Diagram Potable Water System - List
2350-1344	C	Potable Water System Arrangement Camber Deck
2350-1347	C	Potable Water System Arrangement A Deck
2350-1348	C	Potable Water System Arrangement B Deck
2350-1349	D	Potable Water System Arrangement C Deck
2350-1350	C	Potable Water System Arrangement D Deck
2350-1353	H	Pipe Arrangement Potable Water System in Engine Room Plan, Section and Elevation
2350-1354	L	Piping Arrangement Potable Water System Engine Room - L/M
2350-1356	C	Pipe Arrangement Potable Water Tank Plan, Section and Elevation
2350-1357	B	Pipe Arrangement Potable Water Tank List of Material
2400-959	K	Diagram Foam System Arrangement
2400-960	F	Daigram Foam System List
2400-961	H	Deck Piping Foam and Foam Frames 58-73 Upper Deck Arrangement
2400-962	K	Deck Piping FM. & Foam Frames 58-73 Upper Deck L/M
2400-964	H	FM and Foam Piping Upper Deck Frames 73-89 Arrangement
2400-965	F	FM and Foam Piping Upper Deck Frames 73-89 List of Material
2400-967	E	Deck Piping FM & Foam Upper Deck Forward Frame 89 Arrangement
2400-968	J	Deck Piping FM & Foam Upper Deck Froward Frame 89 List of Material
2400-976	C	FM Upper Deck Aft Frame 58 Arrangement

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DWG. NO.	REV.	TITLE
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2400-980	E	Diagram Foam System Arrangement
2400-981	C	Diagram Foam System List
2400-986	J	Foam System Sheet #1
2400-990	D	Foam System Machinery Space 33 Flat and Above Arrangement
2400-992	E	Foam System Machinery Space 33 Flat List of Material
2400-998	C	Faom System Machinery Space Below 30 Flat Arrangement
2400-1000	D	Foam System Machinery Space Below 30 Flat List of Material
2400-1006	B	Arrangement Foam System Cargo Pump Room - Plan, Section and Elevation
2400-1008	B	Arrangement Foam System Cargo Pump Room - List of Material
2400-1011	B	H.PCO_2 System Fire Pump Room Arrangement
2400-1012	B	HP.CO_2 System Fire Pump Room List of Material
2400-1014	A	HP CO_2 System Paint Room Arrangement
2400-1015	A	HP.CO_2 Paint Room List of Material
2400-1017	B	HP.CO_2 System Emergency Generator Room Arrangement
2400-1018	B	HP.CO_2 System Emergency Generator Room List of Material
2400-1020	G	Pipe Arrangement Foam System Engine Room Plan, Section and Elevation
2400-1021	G	Pipe Arrangement Foam System Engine Room - List of Material
2400-1050	D	F/M Arrangement and Details Camber Deck and Above
2400-1124	C	Pipe Arrangement - Foam in Fire Pump Room - Plan, Section, and Elevation
2400-1125	D	Pipe Arrangement Foam in Fire Pump Room - List of Material

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2400-1127	B	2 1/2" Hose Rack for Outside Fire Station
2400-1129	G	Arp L.P. CO_2 Equipment Room
2400-1130	G	Arp. L.P. CO_2 Equipment Room List of Material
2400-1132	F	Arrangement L.P. CO_2 in Machinery Space Below 33'-0 Flat
2400-1133	D	Arrangement L.P. CO_2 in Machinery Space Below 33'-0 Flat L/M
2400-1135	E	Arrangement L.P. CO_2 in Machinery Space 33'-0 Flat
2400-1136	E	Arrangement L.P. CO2 in Machinery Space 33'-60' Flat L/M
2400-1138	F	Arrangement L.P. CO_2 in Machinery Space 60'-78'-4 Flat
2400-1139	E	Arrangement L.P. CO_2 in Machiney Space 60'-78'-4 Flat L/M
2400-1141	G	Arrangement L.P. CO_2 in Machinery Space Above 78'-4 Flat
2400-1142	G	Arrangement L.P. CO_2 in Machinery Space Above 78'-4 Flat L/M
2400-1150	E	Arrangement H.P. CO_2 - CO_2 Equipment Room
2400-1151	E	Arrangement H.P. CO_2 - CO_2 Equipment Room List of Material
2400-1153	F	Arrangement H.P. CO_2 System in Cargo Pump Room
2400-1154	E	Arrangement H.P. CO_2 System in Cargo Pump Room List of Material
2400-1160	C	Piping Arrangement - Pull Cables for Remote Man Release Station in CO_2 Fire Ext. System
2400-1161	C	Piping Arrangement - Pull Cables For Remote Man Release Station in CO_2 Fire Ext. System - List of Material
2400-1202	B	Location and Installation of Fire and Foam Hose Rack L/M
2400-1203	A	Weld Index LP CO_2 Piping
2500-2257	E	Diagram Weather Deck Drains Arrangement
2500-2258	C	Daigram Weather Deck Drains List

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DWG. NO.	REV.	TITLE
2500-2259	F	Diagram Plumbing Soil Drains and Vents Arrangement
2500-2260	C	Diagram Plumbing Soil Drains and Vents List
2500-2261	E	Pipe Arrangement Plating and Sewage System Engine Room Below 60'-0 Level, Plan, Section and Elevation
2500-2262	E	Pipe Arrangement Plating and Sewage System Engine Room Below 60'-0 Level Plan, Section and Elevation - L/M
2500-2267	B	Plumbing Soil Drains and Vents Arrangement A Deck
2500-2268	B	Plumbing Soil Drains and Vents Arrangement B Deck
2500-2269	C	Plumbing Soil Drains and Vents Arrangement C Deck
2500-2270	B	Plumbing Soil Drains and Vents Arrangement D Deck
2500-2271	C	Plumbing Soil Drains and Vents Arrangement Camber Deck
2500-2272	B	Plumbing Soil Drains and Vents Arrangement Nav. Bridge
2500-2275	C	Pipe Inside Sewage Holding Tank Arrangement
2500-2276	C	Pipe Inside Sewage Holding Tank Arrangement List of Material
2500-2277	J	Pipe Arrangement Plumb and Sewage System Above 60'-0 Level - Engine Room Plan, Section and Elevation
2500-2278	H	Pipe Arrangement Plumb and Sewage System Above 60'-0 Level - Engine Room Plan, Section and Elevation - List of Material
2500-2288	H	Bleeder Plugs
2500-2341	F	Pipe Arrangement - Weather Deck Drain in Engine Room, Plan, Section and Elevation
2500-2342	E	Pipe Arrangement Weather Deck DRain in Engine Room L/M
2500-2383	C	Plumbing Drains - Arrangement Between Upper Deck and Camber Deck
2500-2385	E	Weather Deck Drain Aft Deck House - Arrangement
2500-2386	C	Weather Deck Drain Aft Deck House - List of Material
2500-2421	E	Piping Arrangement - Weather Deck Drains Forward Frame 109

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DWG. NO.	REV.	TITLE
2500-2422	F	Piping Arrangement - Weather Deck Drains Forward Frame 109 List of Material
2500-2442	D	Ext. Weather Deck Drains Camber Deck and Above
2502-139	B	Toilet Accessories Arrangement and Details
2502-140	B	Typ. Piping Install. Details and General Notes
2600-63	F	Cargo Oil and Segregated Ballast System in Tank Arrangement Plan Aft Frame 82 1/2
2600-65	E	Cargo Oil and Segregated Ballast System in Tank Aft Frame 82 1/2, Section and Elevation
2600-67	G	Cargo Oil and Segregated Ballast System in tank Forward Frame 82 1/2 Arrangement
2600-68	G	Cargo Oil and Segregated Ballast System in Tanks Forward Frame 82 1/2 Section and Elevation
2600-71	J	Cargo Oil and Segregated Ballast System in Tank Aft Frame 82 1/2 List of Material
2600-72	G	Cargo Oil and Segregated Ballast System in Tank Forward Frame 82 1/2 List of Material
2600-78	G	Arrangement Cargo Oil and Ballast System in Cargo Pump Room Elevations
2600-79	K	Arrangement Cargo Oil and Ballast System in Cargo Pump Room Plan and Section
2600-80	G	Arrangement Cargo Oil and Ballast System in Cargo Pump Room Sections
2600-81	E	Arrangement Cargo Oil and Ballast System in Cargo Pump Room List of Material
2600-84	J	Cargo Oil, Fuel Oil and Diesel Oil System Upper Deck Frames 44-73 List of Material
2600-89	G	Cargo Oil, Fuel Oil and Diesel Oil System Upper Deck Frames 73-89 Arrangement

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DWG. NO.	REV.	TITLE
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2600-92	E	Cargo Oil System Upper Deck Forward Frame 89 Arrangement
2600-101	K	Diagram Cargo Oil and Segregated Ballast System - Arrangement
2600-102	F	Diagram Cargo Oil and Segregated Ballast System - List
2652-252	B	Service Steam Diagram
2652-253	B	Diagram Service Steam System List
2652-254	A	Service Steam Arrangement Steering Gear Flat
2652-255	B	Service Steam System Arrangement Steering Gear Flat B/M
2652-257	B	Service Steam System Arrangement Upper Deck Aft Frame 44
2652-258	B	Service Steam System Arrangement Upper Deck Aft Frame 44 B/M
2652-260	C	Service Steam System Arrangement Camber Deck and Above
2652-262	F	Pipe Arrangement Heating Steam System Engine Room - Plan, Section and Elevation
2652-263	E	Pipe Arrangement Heating System Steam Engine Room - L/M
2670-105	C	Refrig. Piping Arrangement for A/C and Ship Storage Machinery Space - Plan, Section and Elevation
2670-106	D	Refrig. Piping Arrangement for A/C and Ship Storage Machinery Space - B/M
2670-108	C	Refrig. Arrangement for A/C System Outside Machinery Space
2670-112	L	Piping Arrangement A/C and Ships Stores Refg. S.W. Cooling-Plan, Section and Elevation
2670-113	K	Piping Arrangement A/C and Ships Stores Refg. S.W. Cooling List of Material
2680-578	C	Vent, Heating and Cooling Load Cal.
2680-579	D	Vent, Heating and AC Dia. Exclusive of Quarters Area

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2680-581	C	Vent, General Notes - Outside Deck House
2680-583	B	Vent Arrangement Forward Frame 110
2680-584	B	Vent. Arrangement Forward Frame 110 B/M
2680-585	D	Vent Arrangement Aft Deck House Excluding Machinery Space
2680-586	C	Vent Arrangement Aft Deck House Excluding Machinery Space L/M
2680-587	B	Vent Arrangement Steering Gear Flat
2680-588	B	Vent Arrangement Steering Gear Flat B/M
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2680-590	A	Vent Cargo Pump Room B/M
2690-591	B	Vent Mtg. Details for Cargo Pump Room Fans
2680-592	A	Vent Mtg. Details for Cargo Pump Room Fans B/M
2680-595	C	Vent Arrangement A Deck
2680-596	C	Vent Arrangement B Deck
2680-597	C	Vent Arrangement C Deck
2680-598	C	Vent Arrangement D Deck
2680-599	C	Vent Arrangement Camber Deck
2680-600	B	Vent Arrangement Nav. Bridge
2680-601	E	Vent Arrangement Fan Room
2680-671	A	Pump Room Ventilation Study
2680-672	C	Vent Arrangement General Notes and Standard Details
2680-673	A	Vent Arrangement Galley

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2681-49	B	Vent Arrangement Machinery Space Lower Level B/M
2681-50	C	Vent Arrangement Machinery Space 30-0 Level
2681-51	C	Vent Arrangement Machinery Space 30-0 Level B/M
2681-52	E	Vent Arrangement Machinery Space 60-0 Level
2681-53	F	Vent Arrangement Machinery Space 60-0 Level B/M
2681-54	E	Vent Arrangement Machinery Space 78-0 Level Plan View
2681-55	C	Vent Arrangement Machinery Space 78-0 Level B/M
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2681-74	D	Vent Arrangement Machinery Space 74'-4 Level Section and Elevation
2685-117	C	Vent List of Fans Heaters and Cooling Coils and Convectors
2730-218	F	Diagram Inert Gas System - Arrangement
2730-219	C	Diagram Inert Gas System - List
2730-227	F	Piping Arrangement Inert Gas Plant System in Engine Room Plan Section and Elevation
2730-228	H	Pipe Arrangement Inert Gas Plant System in Engine Room L/M
2730-266	C	Piping Arrangement S.W. Scrub System - Inert Gas Plant Plan, Section and Elevation
2730-267	C	Piping Arrangement S.W. Scrub System - Inert Gas Plant L/M
2730-288	D	Inert Gas - Comp Air and Conduit Upper Deck Frames 73-89 Arrangement
2730-289	E	Inert Gas - Comp Air and Conduit Upper Deck Frames 73-89 L/M
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2730-292	F	Inert Gas, Comp. Air and Conduit Upper Deck Forward Frame 89 Arrangement
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2730-340	F	Pipe Arrangement - Tank Level Gages and Inert Gas Stand Pipes in Tanks Aft Frame 82 1/2
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2730-343	G	Pipe Arrangement - Tank Level Gages and Inert Gas Standpipes in Tanks Forward Frame 82 1/2
2730-344	G	Pipe Arrangement - Tank Level Gages and Inert Gas Standpipes in Tanks Forward Frame 82 1/2 List of Material
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2730-383	D	Inerg Gas Supply From Uptakes to Scrubber - List of Material
2750-11	D	Heating Coils in Slop Tanks - Arrangement
2750-12	F	Heating Coils in Slop Tanks - List of Material
2750-21	E	Piping Arrangement - Heating Coil in Slop Tanks, Plan and Elevation
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2960-89	D	List of Label Plates Vent.
2960-90	B	Piping List of Label Plates
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2960-94	G	Label Plates for Bilge and Ballast System Engine Room and Hold
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2960-122	K	Label Plates - Cargo Oil and Segregated Ballast
2960-123	D	Label Plates - Steam and Exhaust System Outside Machinery Space
2960-125	D	Label Plates - Hydraulic System
2960-126	D	Label Plates - CO_2 System
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3200-159	A	Fueling at Sea Arrangement and Details
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3202-120	B	Debarkation Ladders - Ship Installation, List of Material
3202-121	D	Floodlight Supports - Details
3202-123	D	Floodlight Supports - Ship Installation
3202-124	D	Floodlight Supports - Ship Installation - List of Material
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3202-131	B	Protective Covers
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3202-133	B	Debarkation Ladders - Ship Installation
3202-134	A	Floodlight Supports in Way of Deckhouse
3202-135	F	Radar Mast Arrangement and Details
3202-136	F	Radar Mast Details
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3202-145	C	Running Lights and Miscellaneous Rigging Details
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3202-156	C	Jack and Ensign Staff - Ship Installation
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3300-137	J	Miscellaneous Platforms Upper Deck and Above
3300-139	G	Vertical Ladders frames 50-61 (Except in Deck House)
3300-140	D	Vertical Ladders Forward Frame 61 (Except in Cargo Tanks)
3300-141	G	Vertical Ladders Aft Frame 50 (Except in Deck House)
3300-142	F	Inclined Ladders (Except in Cargo Tanks and Deck House) Arrangement and Details
3300-152	G	Rails and Stanchions Arrangement Forward Frame 80 Upper Deck and Above
3300-153	H	Rails and Stanchions Arrangement - Aft Frame 80 Upper Deck and Above
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3300-156	B	Swimming Pool Awning Arrangement and Installation Details

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3300-164	D	Accommodation Ladder Frames 71-76 Port/Starboard - Ship Installation - List of Material
3300-165	C	Accommodation Ladder - Details
3300-168	E	Rails and Stanchions Arrangement Deck House
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3300-213	C	Rails and Stanchions in Cargo Tanks Frames 61-109 - Ship Installation - List of Material
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3400-128	B	Boat Stowage Frames 49-59 Port/Starboard - Ship Installation List of Material
3400-129	A	Inflatable Lifeboat and Stowage Ship Installation
3400-130	A	Inflatable Lifeboat and Stowage Ship Installation List of Material
3400-133	C	Boat Stowage - Details
3400-136	A	Inflatable Lifeboats and Stowage Details
4002-59	N	Arrangement of Emergency Diesel Generator Room Plan, Section and Elevation
4002-60	G	Arrangement of Emergency Diesel Generator Room List of Material
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4200-1354	E	Lighting System Machinery Space Lower Level
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4300-2384	D	Master Electric Clock and Whistle Cont. Ckt CE and W C/D
4300-2385	C	Salinity Ind. System Ckt. 1SB and 2SB Elem and C/D
4300-2386	E	General Alarm System Ckt G Engrs. Emergency Alarm and Watch Call System Att. Monitoral Ckt. G, 1EA, CA and AM C/D
4300-2387	G	Miscellaneous IC System Ckt CWC TM C/D
4300-2389	C	Combustion Control Burner Management, Smoke Ind. and Throttle Control - Ckts CC, BM, CM and TC Cable Diagram
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4300-2403	D	IC Tel and Elex System A Deck Frames 44-58
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4300-2575	F	Miscellaneous IC System, Ckt CWC and TM - Elementary
4300-2576	D	Combustion Control Burner Mang. Smoke Ind. and Throttle Cont. Ckts CC, BM, SM, TC - Wiring Tables
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4300-2652	E	Elect - Conduit Forward Frame 109 List of Material
4300-2667	C	Cargo Valve Cont. and Pos. Indication - Ckt VP - Cabling Diagram

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DWG. NO.	REV.	TITLE
4300-2668	C	Cargo Valve Control and Pos. Indication Ckt VP Field Wiring Elementary
4300-2669	B	Cargo Valve Control and Position Indication Ckt VP Console Wiring Elementary
4300-2670	B	Cargo and Ballast Pump Turbine Control and Indication - Ckt Ft C.O. Water Al Ck 20W Cabling Diagram
4300-2671	C	Cargo and Ballast Pump Turbine Control and Indication - Ckt FT C.O. Water Al Ck 20W Elementary
4300-2672	B	Cargo Tank Level Gaging - Ckt X - Cabling Diagram
4300-2673	C	Inert Gas Plant - Ckt IG - Elementary and Cabling Diagram
4300-2679	D	Main Lube Oil Press and Level; Fuel Oil and Diesel Oil Ckts EC, EL, FO and DO Cabling Diagram
4300-2680	C	Main Lube Oil Pressure and Levek, Fuel Oil and Diesel Oil Ckts EC, EL, FO and DO Wiring Tables
4300-2681	C	Propulsion Plant Temp, Press, Valve Pos. Ind. Lev. and Make-up Stm Heat Control - Ckts PT, PP, 1VP PL and MH Cabling Diagram
4300-2682	E	Propulsion Plant Temp, Press, Valve Pos. Ind, Level and Make-up Stm Heat Cont - Ckts PT, PP, 1VP Pl & MH Elem.
4300-2683	C	Main Feedwater Level, PH Monitoring, Pump Recirc And Pump Speed - Ckts FW, PH, FR and FS Cabling Diagram
4300-2684	E	Main Feedwater Level PH Monitoring, Pump Recirc and Pump Speed - Ckts FW, PH, FR and FS Wiring Tables
4300-2761	B	Cargo Tank Level Gaging Ckt X Elementary Diagram
4300-2789	E	Piping Arrangement - Miscellaneous Conduit V.P. and X - Electric Circuits Upper Deck Aft Frame 75
4300-2790	B	Piping Arrangement - Miscellaneous Conduit V.P. and X - Elect Circuits Upper Deck Aft Frame 75 L/M
4300-2792	E	Piping Arr - Miscellaneous Conduit V.P. and X - Elect Circuits Upper Deck Forward Frame 75
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4300-2821	C	L/M and O/G I.C. Tel and Elex System Accommodation Deck House Camber A, B, C and D Decks
4300-2838	B	Cargo Valve Control & Position Indication Circuit VP Wiring Tables
4300-2839	B	Cargo and Blst Pump Turbine Control and Indication Ckt. FT Cargo Oily Water Alarm Ckt 20W Wiring Table
4300-2840	A	Metal Covers for Electrical Conduit
4600-1065	D	Radio/VHF Rdf Fax and Loran A/C Elementary and C/D
4600-1066	C	Antenna Guidance Plan and Elevation
4600-1067	B	Radar System 3CM 10CM and Collision Avoidance C/D
4600-1068	C	Echo Depth Sounder/Docking Sounder Ckt ES and DS C/D
4600-1069	C	Arrangement of Radar Waveguides and Location of Elect. Equipment on Radar Mast
4700-1078	D	Main Wireways Machinery Space Lower Level
4700-1079	L	Main Wireways Machinery Space 30 Foot Flat
4700-1080	E	Main Wireways Machinery Space 60 Foot Flat
4700-1081	G	Main Wireways Machinery Space 78 Foot Flat and Above
4700-1083	B	Main Wireways Upper Deck Frames 58-109 (Excluding Pump Room Excess)
4700-1084	B	Main Wireways Upper and Below Deck Forward Frame 109
4700-1085	C	Main Wireways Camber Deck
4700-1086	D	Main Wireways Steering Gear Flat
4700-1369	A	Main Wireways Arrangement "A" Deck
4700-1370	A	Main Wireways Arrangement "B" Deck
4700-1371	B	Main Wireways Arrangement "C" Deck

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DWG. NO.	REV.	TITLE
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4700-1546	E	Main Wireways Between Upper and Camber Deck
4700-1547	D	Main Wireways Upper Deck Aft Frame 44
4700-1586	G	Cable Routing - Main Wireways 33' Flat Machinery Space
4800-262	E	Sp Tel System Ckt 1JV, 2JV, 3JV, 4JV and 5JV C/D
4800-261	D	Shoreline and Ship Service Tel System Ckt 1J and 2J C/D
4800-311	B	Shoreline and Ship Service Tel Sys - Ckt 1J and 2J - Elem.
4800-312	D	Sp Tel System Ckt 1JV, 2JV, 3JV, 4JV and 5JV - Elementary
4960-3	B	Electrical Label Plates Machinery Space Lower Level
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4960-6	B	Electrical Label Plates Machinery Space 30 Foot Flat
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4960-9	B	Electrical Label Plates Pump Room and Access
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4960-12	C	Electrical Label Plates Nav. Bridge Deck and Top of Nav. Bridge
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4960-14	B	Electrical Label Plates Upper Deck and Below Forward Frame 109
4960-15	A	Electrical Label Plates Elevator
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5052-4	B	Swimming Pool Ladder Fittings Details
5052-5	B	Swimming Pool Ladder Arrangement - Ship Installation L/M
5100-12	C	Joiner Stairs Arrangement and Details
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5200-63	B	Joiner Arrangement B Deck
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5350-222	C	Builders Nameplate
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6301-221	B	Shaft Tools
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6340-272	A	Lifting Gear Arrangement and Details Tailshaft Withdrawal Gear
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6450-698	E	Diagram Gland Seal Leak Off and Turbine Drain Pipe - Arr.
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6450-703	E	Piping Arrangement 220 PSI Contam Steam System Engine Room Plan, Section and Elevation
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6450-777	F	Steam and Exhaust Upper Deck Frames 89-105 Arrangement
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6450-835	E	Weld Index - Cont. Steam Upper Deck Frames 58-73
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6451-502	E	Pipe Arrangement L.P. Bleed Steam Plan - Section and Elevation
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MARAD HULL NUMBERS 609, 610

DWG. NO.	REV.	TITLE
6454-535	F	Diagram Comp. Air System - Arrangement
6454-536	E	Diagram Comp. Air System - List
6454-537	G	Pipe Arrangement Ship Service Air System Engine Room - Below 60'-0 Flat - Plan, Section and Elevation
6454-538	F	Pipe Arrangement Ship Service Air System Engine Room - Below 60'-0 Flat - List of Material
6454-540	H	Pipe Arrangement Control Air System Engine Room - Below 60'-0 Flat - Plan Section and Elevation
6454-541	G	Pipe Arrangement Control Air System Engine Room - Below 60'-0 Foot Flat - List of Material
6454-556	J	Pipe Arrangement Ship Service Air Engine Room Above 60'-0 Flat Plan, Section and Elevation
6454-557	K	Pipe Arrangement Ship Service Air Engine Room Above 60'-0 Flat, List of Material
6454-559	F	Pipe Arrangement Contr. Air Engine Room Above 60'-0 Flat Plan, Section and Elevation
6454-560	F	Pipe Arrangement Contr Air Engine Room Above 60'-0 Flat List of Material
6454-592	D	Piping Arrangement - Contr Air to Cargo and Ballast Pump Turbines Engine Room, Plan, Section and Elevation
6454-593	D	Piping Arrangement - Contr. Air to Cargo and Ballast Pump Turbines Engine Room Plan, Section and Elevation - L/M
6550-310	C	Special Fittings Sea Water Circ. System - Engine Room
6550-359	F	Arrangement Main Sea Water Circ. System Engine Room - Plan, Section and Elevation
6550-360	J	Diagram Main and Auxiliary Sea Water Circ. System - List
6550-361	K	Main and Auxiliary Sea Water Circ. System - Arrangement
6550-362	F	Pipe Arrangement Main Sea Water Circ. System Engine Room - L/M
6550-365	D	Pipe Arrangement Auxiliary Sea Water Circ. Sea Chest to Strainer Plan, Section and Elevation

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MARAD HULL NUMBERS 609, 610

DWG. NO.	REV.	TITLE
6550-366	B	Pipe Arrangement Auxiliary Sea Water Circ. Sea Chest to Strainer L/M
6550-368	D	Pipe Arrangement Vents from Sea Chest and Cond. In Engine Room Plan, Section and Elevation
6550-369	C	Pipe Arrangement Vents from Sea Chest and Cond. In Engine Room - L/M
6550-385	F	Pipe Arrangement S.W. Cooling Cargo, Fire and Ballast Pump Turbine - Plan, Section and Elevation
6550-386	F	Pipe Arrangement S.W. Cooling For Cargo, Fire and Ballast Pump Turbine - L/M
6550-421	C	Sea Water Circ. System - Camber Deck and Above
6550-431	F	Pipe Arrangement S.W. Cooling System for Equipment Above 33'-0 Flat Engine Room - Plan, Section and Elevation
6550-432	F	Pipe Arrangement S.W. Cooling System for Equipment Above 33'-0 Flat Engine Room L/M
6550-437	B	Piping Arrangement Swimming Pool Fill and Drain - Plan, Section and Elevation
6550-438	C	Piping Arrangement Swimming Pool Fill and Drain - L/M
6550-440	F	Arrangement Cooling Water and Compressed Air for Vac. Strip System in Cargo Pump Room
6550-441	F	Arrangement Cooling Water and Compressed Air for Vac. Strip System in Cargo Pump Room - List of Material
6550-467	A	Pipe Arrangement - Toxion Inject for Sea Water System - Plan, Section and Elevation
6550-468	A	Piping Arrangement - Toxion Inject for Sea Water System - List of Material
6552-372	G	Diagram Blr Feed Water System Arrangement
6552-373	F	Diagram Blr Feed Water System - List
6552-374	E	Pipe Arrangement Feed Pump Suction Plan, Section and Elevation
6552-375	G	Pipe Arrangement Feed Pump Suction - List of Material

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DRAWING INDEX NEWPORT NEWS HULL NUMBER 613C, 614C

MARAD HULL NUMBERS 608, 610

DWG. NO.	REV.	TITLE
6552-377	K	Pipe Arrangement Feed Pump Dish. System - Plan, Section and Elevation
6552-378	H	Pipe Arrangement Feed Pump Dish. System - List of Material
6552-380	H	Diagram Cnds. Res. and Make-Up Feed System Arrangement
6552-381	H	Diagram Cnds. Res. and Make-Up Feed System List
6552-382	P	Pipe Arrangement Main Cnds. System - Plan, Section and Elevation
6552-383	M	Pipe Arrangement Main Cnds. System - L/M
6552-385	D	Pipe Arrangement Dstl. Water Tanks - Plan, Section and Elevation
6552-386	B	Pipe Arrangement Dstl Water Tanks - List of Material
6552-388	H	Pipe Arrangement Res and Make-Up Fd. System Engine Room Plan, Section and Elevation
6552-389	K	Pipe Arrangement Res. and Make-Up Fd. System Engine Room List of Material
6552-391	J	Pipe Arrangement Cnds. Trans. and Drain System -Plan, Section and Elevation
6552-392	K	Pipe Arrangement Cnds. Trans and Drain System - List of Material
6552-409	D	Weld Index Feed Discharge Piping
6552-410	H	Piping Arrangement Auxiliary Condensate System Plan, Section and Elevation
6552-411	H	Piping Arrangement Auxiliary Condensate System List of Material
6552-431	C	Pipe Arrangement - Main Feed Pump Recirc. - Plan, Section and Elevation
6552-432	B	Pipe Arrangement - Main Feed Pump Recirc. - List of Material
6552-442	B	Pipe Hangers - Feed Pump Disch. - Engine Room for Arrangement Drawing 6552-377

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MARAD HULL NUMBERS 609, 610

DWG. NO.	REV.	TITLE
6552-443	A	Pipe Hangers - Feed Pump Suction - Engine Room for Arrangement Drawing 6552-374
6555-464	H	Diagram Drain Coll. System Arrangement
6555-465	J	Diagram Drain Coll. System - List
6555-466	E	Pipe Arrangement LP St. Drain System Engine Room - Plan, Section and Elevation
6555-467	E	Pipe Arrangement LP St Drain System Engine Room - L/M
6555-469	G	Pipe Arrangement Contam Steam Drain System Engine Room Plan, Section and Elevation
6555-470	F	Pipe Arrangement Contam Steam Drain System Engine Room List of Material
6555-472	H	Pipe Arrangement Dirty Drain System Engine Room - Plan, Section and Elevation
6555-473	G	Pipe Arrangement Dirty Drain System Engine Room - List of Material
6555-475	G	Pipe Arrangement H.P. Steam Drain System Engine Room - Plan, Section and Elevation
6555-476	F	Pipe Arrangement H.P. STeam Drain System Engine Room - List of Material
6555-491	D	Piping Arrangement Slop Tank Htg Coil Drains in Engine Room Plan, Section and Elevation
6555-492	D	Piping Arrangement Slop Tank Htg. Coil Drains in Engine Room List of Material
6555-567	F	Piping Arrangement Turbine Drain System Engine Room Plan, Section and Elevation
6555-568	F	Piping Arrangement Turbine Drain System Engine Room List of Material
6557-83	E	Diagram Boiler Water Sampling and Boiler Blower System Arrangement
6557-84	E	Diagram Boiler Water Sampling and Boiler Blower System List of Material

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DRAWING INDEX NEWPORT NEWS HULL NUMBERS 613C, 614C

MARAD HULL NUMBERS 609, 610

DWG. NO.	REV.	TITLE
6557-85	E	Pipe Arrangement Boiler Water Sampling and Boiler Blower System - Plan, Section and Elevation
6557-86	D	Pipe Arrangement Boiler Water Sampling and Boiler Blower System - List of Material
6557-88	D	Diagram Distilling Plant System - Arrangement
6557-89	D	Diagram Distilling Plant System - List of Material
6557-90	F	Pipe Arrangement Distilling Plant System - Plan, Section and Elevation
6557-91	E	Pipe Arrangement Distilling Plant System - List of Material
6650-231	G	Details Ladder and Grating in Machinery Space
6650-232	F	Arrangement Floor Plates, Grating and Ladder Below 30-0 Flat Engine Room - Plan, Section and Elevation
6650-233	E	Arrangement Floor Plates, Grating and Ladder Below 30-0 Flat Engine Room - List of Material
6650-234	E	Arrangement Floor Plates, Grating and Ladder 30-0 Flat to 60-0 Flat Engine Room
6650-235	C	Arrangement Floor Plates, Grating and Ladder 30-0 Flat to 60-0 Flat Engine Room - List of Material
6650-236	G	Arrangement Floor Plates, Grating and Ladder 60-0 to 78-3 Flat Engine Room
6650-237	G	Arrangement Floor Plates, Grating and Ladder 60-0 to 78-3 Flat Engine Room - List of Material
6650-238	J	Arrangement Floor Plates, Grating and Ladder 78-3 Flat and Above Engine Room - Plan, Section and Elevation
6650-239	F	Arrangement Floor Plates, Grating and Ladder 78-3 Flat and Above Engine Room - List of Material
6650-251	F	Arrangement Ladder and Grating and Floor Plts. in Cargo Pump Room
6650-252	F	Arrangement Ladder and Grating and Floor Plts. in Cargo Pump Room - List of Material

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MARAD HULL NUMBERS 609, 610

DWG. NO.	REV.	TITLE
6650-253	E	Arrangement Ladder, Grating and Floor Pl. in Cargo Pump Room Details
6650-277	C	Arrangement Ladders Floor Plates - Steering Gear Space
6650-279	B	Ladders and Floor Plates L/M Steering Gear Space
6750-481	A	Typ. Arrangement of Gage Pipe
6750-482	F	List of Therm. Furnished by Shipyard
6750-483	G	List of Press and Vac Gages Furnished by Shipyard
6750-484	B	List of Press and Vac Gages and Therm Furnished by Subcontractor
6750-486	F	Thermometers for Piping System - Group Sheets
6750-487	D	Miscellaneous Gage Board in Engine Room - Arrangement
6750-488	E	Miscellaneous Gage Boards in Engine Room - List of Material
6750-489	B	Gage Piping in Engine Room - List of Material
6750-566	A	Mechanical Whistle Pull Arrangement and Details. (Accom. Dk House)
6750-567	C	Mechanical Whistle Pull Arrangement and Details. (Outside Accom. Deck House)
6750-568	D	Mechanical Whistle Pull (Outside Accom. Deck House) - L/M
6755-53	B	Throttle Control Arrangement
6755-54	B	Throttle Control Arrangement B/M
6755-67	F	Piping Arrangement Miscellaneous Instrument in Engine Room Plan, Section and Elevation
6755-68	F	Piping Arrangement Miscellaneous Instrument in Engine Room List of Material
6755-71	B	Tank Connections for Instruments Arrangement and List of Material
6755-72	C	Throttle Control Hydraulic Piping System Arrangement
6755-73	C	Throttle Control Hydraulic Piping System List of Material

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MARAD HULL NUMBERS 609, 610

DWG. NO.	REV.	TITLE
6755-77	A	Centralized Engine Room Controls - Set Point and Design Data
6800-62	B	Boilers Procedure for Boiler Care
6900-73	F	Smoke Stack Outer
6900-74	D	Uptakes 106'-0 Level and Above - Arrangement
6900-76	C	Uptakes Below 106'-0 Level Arrangement
6900-77	C	Uptakes Below 106'-0 Level B/M
6900-82	C	Smoke Indicator Arrangement
6900-83	C	Smoke Indicator B/M
6901-22	G	Forced Draft Blower Duct Arrangement and Details
6901-23	H	Forced Draft Blower Duct Arrangement and Details B/M
6901-25	B	Forced Draft Blower Vane Operating Gear - Arrangement
6901-26	B	Forced Draft Blower Vane Operating Gear - B/M
6950-98	G	Diagram Fuel Oil and Diesel Oil Service Fill and Tran. System Arrangement
6950-99	G	Diagram Fuel Oil and Diesel Oil Service Fill and Tran. System - List
6950-100	H	Pipe Arrangement Fuel Oil Service Discharge System - Plan. Section and Elevation
6950-101	F	Pipe Arrangement Fuel Oil Service Discharge System - L/M
6950-103	D	Pipe Arrangement Fuel Oil Service Suction System - Plan, Section and Elevation
6950-104	B	Pipe Arrangement Fuel Oil Service Suction System - L/M
6950-109	F	Piping Arrangement Fuel Oil Service Recirc. System - Plan, Section and Elevation
6950-110	E	Piping Arrangement Fuel Oil Service Recirc System - L/M

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MARAD HULL NUMBERS 609, 610

DWG. NO.	REV.	TITLE
6951-122	F	Heating Coils in Fuel Oil Tanks - Arrangement
6951-123	D	Heating Coils in Fuel Oil Tanks - List of Material
6960-101	B	Label Plates for Sea Valve Engine Room
6960-102	E	Label Plates for Lube Oil System Engine Room
6960-103	C	Label Plates for Main Steam System Engine Room
6960-104	F	Label Plates for Auxiliary System Engine Room
6960-105	E	Label Plates for Auxiliary Exhaust Engine Room
6960-106	D	Label Plates for Comp. Air System Engine Room
6960-107	D	Label Plates for Main Sea Water System Engine Room
6960-108	F	Label Plates Auxiliary Sea Water System Engine Room
6960-109	A	Label Plates for Blower Feed System Engine Room
6960-110	E	Label Plates for Cond. Resv. Feed and Make-Up Feed System Engine Room
6960-111	E	Label Plates for Contam Steam Generator System Engine Room
6960-112	C	Label Plates for Drain Coll. System Engine Room.
6960-113	D	Label Plates for Boiler Water Samp. and Blower System Engine Room
6960-114	D	Label Plates for Distilling Plant System Engine Room
6960-115	D	Label Plates for Fuel Oil Service System Engine Room
6960-117	D	Label Plates for Miscellaneous Pumps and Equipment Engine Room
6960-118	B	Label Plates Miscellaneous Instruments in Engine Room
7000-104	G	Insulation and Sheathing Outside Deck House Arrangement and Details
7000-110	E	Joiner Insulation Deck Houses
7000-111	B	Sheet Metal Sheathing Arrangement Deck Houses

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MARAD HULL NUMBERS 609, 610

DWG. NO.	REV.	TITLE
7500-364	G	Galley Arrangement
7500-366	A	Galley Details
7500-369	B	Galley and Miscellaneous Commissary Foundations
7500-383	B	Galley Sheathing
7500-387	A	Garbage Compactor Room - Arrangement and Foundations
7600-453	B	Paint Locker Upper Deck Frames 23-27 Arrangement
7600-454	B	Paint Locker Upper Deck Frames 23-27 Details and Section
7600-455	B	Paint Locker Upper Deck Frames 23-27 List of Materials
7600-456	B	Deck Maint Shop Upper Deck Frames 34-38 Arrangement
7600-457	B	Deck Maintence Shop Upper Deck Frames 34-38 Detail and Section
7600-458	B	Deck Maintence Shop Upper Deck Frames 34-38 List of Material
7600-459	B	Laundries Arrangement and Details
7600-460	D	Engineers and Electrical Workshop 60'-0 Level Frames 52-58 Fabrication Details for Shop
7600-461	C	Engineers and Electrical Workshop 60'-0 Level Frames 52-58 List of Material
7600-462	E	Engineers and Electrical Workshop 60'-0 Level Frames 52-58 Installation Details
7600-496	A	Battery Locker - Upper Deck Frames 21-23 Port and 26-28 Port Installation Details
7600-497	A	Battery Locker - Upper Deck Frames 21-23 Port and 26-28 Port Fabrication Details
7600-498	A	Battery Locker - Upper Deck Frames 21-23 Port and 26-28 Port List of Material
7700-540	D	Storerooms in Machinery Spaces - Installation L/M
7700-541	A	Stowage - FW Filling Hose Ship Installation
7700-542	A	Stowage - FW Filling Hose Ship Installation - List of Material

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MARAD HULL NUMBERS 609, 610

DWG. NO.	REV.	TITLE
8000-87	G	Fire Extinguishers and Fire Axes - Ship Installation
8000-88	A	Ships Bell and Gong - Details
8000-90	C	Ships Bell and Gong - Ship Installation
8000-91	A	Ships Bel and Gong - Ship Installation - L/M
8000-92	B	Life Preservers and Ring Buoys - Details
8000-93	E	Life Preservers and Ring Buoys - Ship Installation - L/M
8000-94	E	Life Preservers and Ring Buoys - Ship Installation
8000-95	E	Fire Extinguishers and Fire Axes - Ship Installation - L/M
8000-97	A	Watch Bell
8000-98	A	Life Preserver Stowage in Deck House
8100-14	H	Anchor Handling - Arrangement and Details
8200-42	B	Window Curtains
8300-40	D	Painting Schedule

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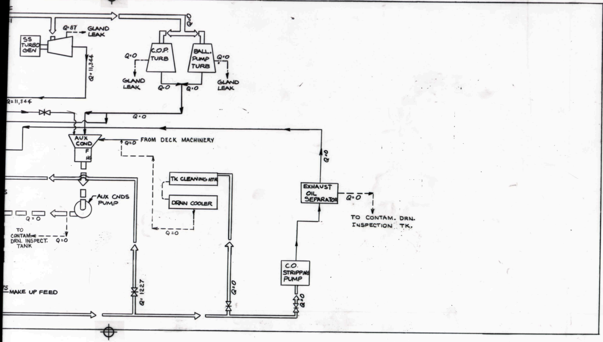
MARAD HULL NUMBERS 609, 610

DWG. NO.	REV.	TITLE
7700-543	A	Storerooms 2nd Deck Forward Details
7700-544	A	Storerooms 2nd Deck Forward Ship Installation List of Material
7700-545	A	Storerooms 2nd Deck Forward Ship Installation
7700-546	A	Storerooms 78'-4 Flat Aft - Details
7700-547	A	Storerooms 78'-4 Flat Aft - Ship Installation L/M
7700-548	A	Storerooms 78'-4 Flat Aft Ship Installation
7700-549	F	Storerooms in Machinery Spaces - Arrangement Ship Installation
7700-550	A	Storerooms Upper Deck Frames 21-25 (S) Details
7700-551	A	Storerooms Upper Deck Frames 21-25 (S) Ship Installation L/M
7700-552	A	Storerooms Upper Deck Frames 21-25 (S) Ship Installation
7700-553	B	Stowage Boxes - Line Gun and Deck Gear
7700-554	C	Storerooms and Lockers in Deckhouse
7700-598	F	Spare Anchor Propeller and Tail Shaft Stowage Details
7700-625	F	Strm in Machinery Space Details
7700-626	F	Spare Propeller Anchor and Tail Shaft Stow Ship Installation Arrangement -
7700-627	E	Spare Propeller Anchor and Tail Shaft Stow. Ship Installation List of Material
7700-628	C	Strm 78'-4 Flat Aft - Details
7700-655	B	Stow - FW Filling Hose Details
7700-657	A	Stow Boxes - Tel and Loudspeaker Details
7700-783	B	Spare Parts Storage Cabinets - Arrangement and Details
8000-85	D	Miscellaneous Deck and Navigation Gear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GLAND LEAK
Q=11,344
Q=11,344
Q=0
C.O.P. TURB
BALL. PUMP TURB
Q=0
Q=0
GLAND LEAK
Q=0
Q=0
GLAND LEAK
Q=0
AUX COND
F
HG
Q=0
FROM DECK MACHINERY
TK CLEANING HTR
DRN COOLER
Q=0
AUX CNDS PUMP
Q=0
TO CONTAM. DRN. INSPECT. TANK
Q=0
Q=0
EXHAUST OIL SEPARATOR
Q=0
TO CONTAM. DRN. INSPECTION TK.
C.O. STRIPPING PUMP
Q=0
Q=1227
Q=0
MAKE UP FEED

LEGEND

SUPERHEATED STEAM	▭
DESUPERHEATED STEAM	▬
LOW PRESSURE & BLEED STEAM	—
FEED AND CONDENSATE	▭ ▭ ▭
DRAIN	– – – –

◺ TRAP OR DRN REGULATOR

⋈ PRESS OR TEMP CONTROL VALVE

⋈ BACK PRESSURE VALVE

PG-PSIG
PA-PSIA
Q=LB/HR FLOW
h= BTU/LB
F-TEMP DEG FAHRENHEIT

STEAM AND FEED CONDITIONS

SUPERHEATER OUTLET	850 PSIG	950° F
DESUPERHEATER OUTLET	848 PSIG	545° F
MAIN TURBINE THROTTLE	830 PSIG	945° F
MAIN CONDENSER VACUUM AT	75° F INJ	28.52 HG
FEED WATER TEMP TO BOILER		419.5° F
FUEL OIL BURNED		20,219 LB/HR

CALCULATED FUEL RATE 0.4493 LB/SHP HR

BASED ON:

MAIN TURB EQUIV. NON EXTR ST RATE	5.33 LB/SHP HR
BOILER EFFICIENCY	89.71 %
HHV OF FUEL	18,500 BTU/LB
AIR TEMP TO FD BLOWERS	100° F
DISTILLING PLANT LOAD	12,100 GPD
TURBO-GENERATOR LOAD	1120 KW
SHAFT HORSEPOWER	45,000 SHP

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS

OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPT.
FSCM NO. 43689

CALC WDB
DRAWN WDB
CHECKED SAW
SECT MGR
DATE COMPL. 11-10-77
EXAMINED ~
AUTHORIZED A. Conley
DATE
TECH APPROVAL
CSD APPROVAL R. L. Harrington

390,000 DEADWEIGHT TANKER
HEAT BALANCE AND FLOW DIAGRAM
ABS POWER (1120 KW)

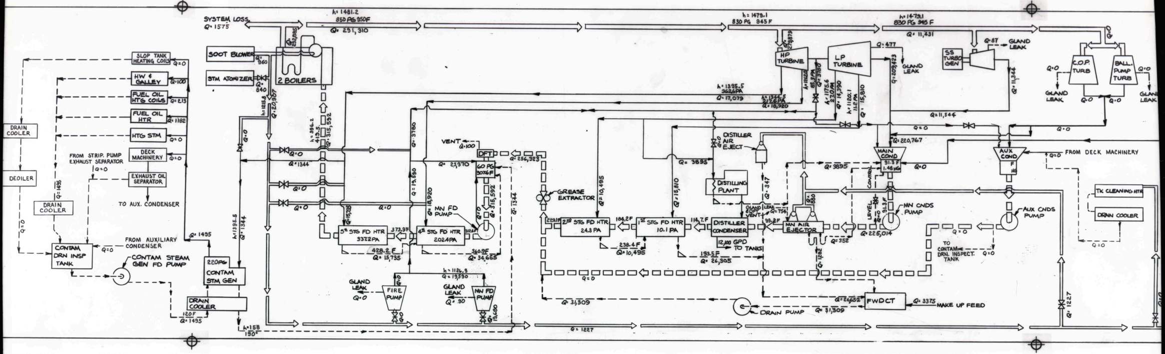
USMA DESIGN T11-S-116A
USMA DWG NO.
HULL NO.
DWG NO. 216619
REV C
SHEET NO. 1 OF 1

216619

SEPT. '80

6X

1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850 PG 950F
Q= 291,310
Q= 292,885
SOOT BLOWER
Q= 960
STM ATOMIZER
Q= 840
2 BOILERS
h= 1215.8
Q= 20,907
h= 396.2
419.5
Q= 315,592
SLOP TANK HEATING COILS
Q=0
HW & GALLEY
Q=100
FUEL OIL HTG COILS
Q=213
FUEL OIL HTR
Q=1182
HTG STM
Q=0
DECK MACHINERY
Q=0
DRAIN COOLER
DEOILER
FROM STRIP. PUMP EXHAUST SEPARATOR
Q=0
EXHAUST OIL SEPARATOR
TO AUX. CONDENSER
Q= 1495
DRAIN COOLER
Q=0
CONTAM DRN INSP TANK
FROM AUXILIARY CONDENSER
Q=0
CONTAM STEAM GEN FD PUMP
Q= 1495
220PG
CONTAM STM GEN
h=1395.5
Q= 1344
DRAIN COOLER
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Q= 3780
Q= 19,590
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VENT
Q=100
DFT
Q= 23,370
60 PG
307.6F
Q= 256,323
MN FD PUMP
Q=0
Q= 315,592
Q= 1344
5th STG FD HTR
337.2PA
373.9F
4th STG FD HTR
202.4PA
312.6F
428.2 F
Q= 15,735
360.9F
Q= 34,665
h= 1126.9
Q= 19,590
GLAND LEAK
Q=0
FIRE PUMP
Q=0
Q=0
GLAND LEAK
Q= 90
MN FD PUMP
Q= 19,680
GREASE EXTRACTOR
Q= 10,495
Q= 15,810
229.1F
2nd STG FD HTR
24.3 PA
184.2F
1st STG FD HTR
10.1 PA
114.7F
238.4F
Q= 10,495
193.5F
Q= 26,305
Q=0
Q= 31,309
Q= 1227
h= 1479.1
830 PG 945 F
Q= 279,879
HP TURBINE
LP TURBINE
Q= 477
GLAND LEAK
Q= 209,423
h= 1395.5
362.6PA
Q= 17,079
h= 1344.5
217.6PA
Q= 18,920
h= 1262.0
85.3PA
Q= 3780
h= 1175.6
27.0PA
Q= 14,390
h= 1120.1
11.2PA
Q= 15,810
h= 1479.1
830 PG 945 F
Q= 11,431
SS TURBO GEN
Q= 87
GLAND LEAK
Q= 11,344
Q= 11,344
Q=0
C.O.P. TURB
BALL. PUMP TURB
Q=0
Q=0
GLAND LEAK
Q=0
Q=0
GLAND LEAK
Q=0
Q=0
DISTILLER AIR EJECT
Q=0
Q= 3895
DISTILLING PLANT
Q= 347
Q= 220,767
MAIN COND
91.3 F
1.48 HG
Q= 3895
CONTROL
Q=0
AUX COND
F
HG
FROM DECK MACHINERY
Q=0
GLAND LEAK
EDFT VENT
Q= 754
Q= 880
99.2F
DISTILLER CONDENSER
12,100 GPD TO TANKS
MN AIR EJECTOR
LEVEL
Q=0
91.3F
MN CNDS PUMP
Q= 225,014
Q= 352
Q= 1282
AUX CNDS PUMP
Q=0
TO CONTAM. DRN. INSPECT. TANK
Q=0
TK CLEANING HTR
DRNN COOLER
Q=0
FWDCT
Q= 26,652
Q= 3375
MAKE UP FEED
DRAIN PUMP
Q= 31,309
Q= 1227
Q=0

216619

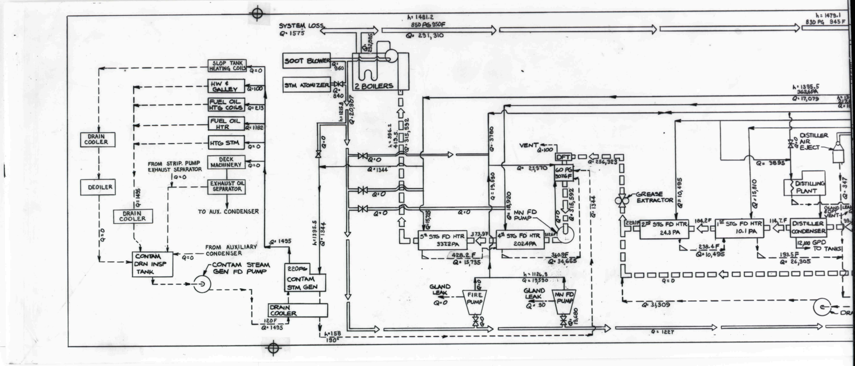
MICRO-MASTER 105 mm

K+E

SEPT. '80

6X

2

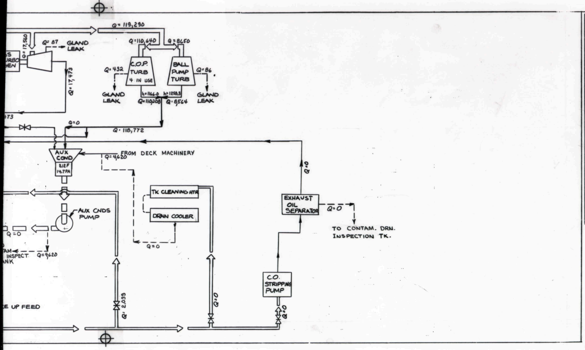

SYSTEM LOSS
Q= 1575
h= 1481.2
850 PG 950F
Q= 291,310
h= 1479.1
830 PG 945 F
Q= 292,885
SOOT BLOWER
Q= 960
STM ATOMIZER
Q= 840
2 BOILERS
h= 1215.8
Q= 20,907
h= 396.2
419.5
Q= 315,592
SLOP TANK HEATING COILS
Q=0
HW & GALLEY
Q=100
FUEL OIL HTG COILS
Q=213
FUEL OIL HTR
Q=1182
HTG STM
Q=0
DECK MACHINERY
Q=0
DRAIN COOLER
DEOILER
FROM STRIP. PUMP EXHAUST SEPARATOR
Q=0
EXHAUST OIL SEPARATOR
TO AUX. CONDENSER
Q= 1495
DRAIN COOLER
Q=0
CONTAM DRN INSP TANK
FROM AUXILIARY CONDENSER
Q=0
CONTAM STEAM GEN FD PUMP
Q= 1495
220PG
CONTAM STM GEN
h=1395.5
Q= 1344
DRAIN COOLER
120F
Q= 1495
h=158
190°
Q=0
Q=0
Q=1344
Q=0
Q=0
Q= 3780
Q= 19,590
Q= 18,920
VENT
Q=100
DFT
Q= 256,323
Q= 23,370
60 PG
307.6F
Q= 315,592
Q=0
MN FD PUMP
Q= 1344
Q=15,735
Q=0
5th STG FD HTR
337.2PA
373.9F
4th STG FD HTR
202.4PA
312.6F
428.2 F
Q= 15,735
360.9F
Q= 34,665
h= 1126.9
Q= 19,590
GLAND LEAK
Q=0
FIRE PUMP
Q=0
Q=0
GLAND LEAK
Q= 90
MN FD PUMP
Q= 19,680
GREASE EXTRACTOR
229.1F
2ND STG FD HTR
24.3 PA
Q= 10,495
184.2F
238.4F
Q= 10,495
1ST STG FD HTR
10.1 PA
Q= 15,810
114.7F
h= 1395.5
362.6PA
Q= 17,079
DISTILLER AIR EJECT
Q=0
Q= 3895
DISTILLING PLANT
Q= 347
DISTILLER CONDENSER
12,100 GPD TO TANKS
GLAND LEAK
& DFT VENT
193.5F
Q= 26,305
Q=0
Q= 31,309
DRA
Q= 1227

216619

SEPT. '80

6X

3


Q = 119,290
Q = 17,560
Q = 87
GLAND LEAK
SS TURBO GEN
Q = 17,473
Q = 110,640
Q = 8650
C.O.P. TURB 4 IN USE
BALL PUMP TURB
Q = 432
Q = 86
GLAND LEAK
GLAND LEAK
h = 1166.0
h = 1258.3
Q = 110,208
Q = 8,564
473
Q = 0
Q = 118,772
AUX COND 212F 14.7PA
FROM DECK MACHINERY
Q = 4,620
Q = 0
TK CLEANING HTR
DRAIN COOLER
Q = 0
AUX CNDS PUMP
Q = 0
TAM INSPECT ANK
Q = 4,620
EXHAUST OIL SEPARATOR
Q = 0
TO CONTAM. DRN. INSPECTION TK.
C.O. STRIPPING PUMP
Q = 0
Q = 0
Q = 2,039
E UP FEED

LEGEND

SUPERHEATED STEAM
DESUPERHEATED STEAM
LOW PRESSURE & BLEED STEAM
FEED AND CONDENSATE
DRAIN

TRAP OR DRN REGULATOR
PRESS OR TEMP CONTROL VALVE
BACK PRESSURE VALVE

PG - PSIG PA - PSIA Q = LB/HR FLOW
h = BTU/LB F - TEMP DEG. FAHRENHEIT

STEAM AND FEED CONDITIONS
SUPERHEATER OUTLET 850 PSIG 945°F
DESUPERHEATER OUTLET 834 PSIG 561°F
MAIN TURBINE THROTTLE 830 PSIG 940°F
MAIN CONDENSER VACUUM AT 75°F INJ 28.66" HG
FEED WATER TEMP TO BOILER 416.6°F
FUEL OIL BURNED 12,285 LB/HR

CALCULATED FUEL RATE – LB/SHP HR
BASED ON:
MAIN TURB EQUIV. NON EXTR ST RATE – LB/SHP HR
BOILER EFFICIENCY 89.6 %
HHV OF FUEL 18,500 BTU/LB
AIR TEMP TO FD BLOWERS 100° F
DISTILLING PLANT LOAD 0 GPD
TURBO-GENERATOR LOAD 1830 KW
SHAFT HORSEPOWER – SHP

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPT. FSCM NO. 43689

CALC WDB
DRAWN WDB
CHECKED SAW
SECT MGR J. McMurray
DATE COMPL. 5-12-78
EXAMINED ~
AUTHORIZED A. Conley
DATE 5-18-78
TECH APPROVAL
CSD APPROVAL

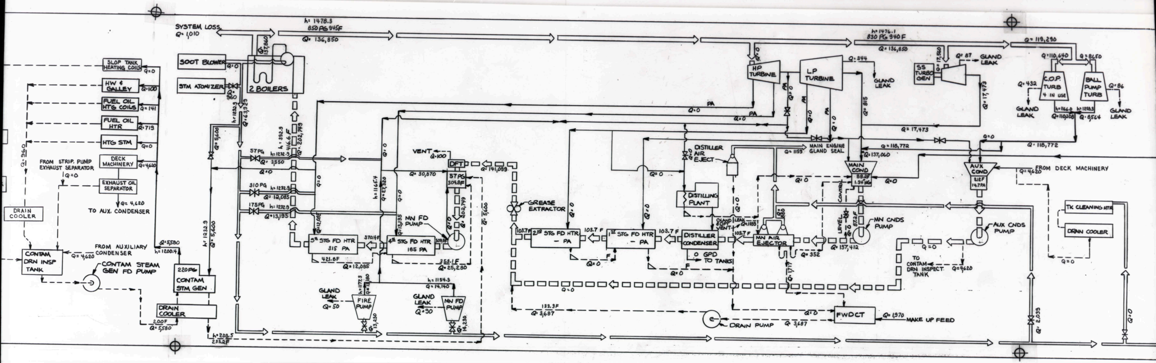
390,000 DEADWEIGHT TANKER HEAT BALANCE AND FLOW DIAGRAM
PORT PUMPING

USMA DESIGN T11-S-116A
USMA DWG NO.
HULL NO.
DWG NO. 216620
REV B
SHEET NO. 1 OF 1

216620

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
1
6X


SYSTEM LOSS
Q= 1,010
h= 1478.3
850 PG 945F
Q= 136,850
Q= 137,860
SOOT BLOWER
Q= 0
STM ATOMIZER
Q= 960
2 BOILERS
SLOP TANK HEATING COILS
Q=0
HW & GALLEY
Q=100
FUEL OIL HTG COILS
Q= 141
FUEL OIL HTR
Q=719
HTG STM
Q=0
DECK MACHINERY
Q=4,620
Q= 960
FROM STRIP. PUMP EXHAUST SEPARATOR
Q=0
EXHAUST OIL SEPARATOR
Q= 4,620
TO AUX. CONDENSER
DRAIN COOLER
CONTAM DRN INSP TANK
Q= 4,620
FROM AUXILIARY CONDENSER
Q=5,580
h= 1200.4
CONTAM STEAM GEN FD PUMP
220PG
CONTAM STM GEN
DRAIN COOLER
200F
Q= 5,580
h= 203.5
235.2F
h= 1232.9
Q= 63,929
Q= 5,600
h= 1232.9
Q= 5,600
h = 392.9
416.6 F
Q= 202,749
57PG
h= 1232.9
Q= 3,550
Q=0
310 PG
h= 1232.9
Q= 12,085
175PG
h= 1232.9
Q= 13,195
Q=0
Q= 12,085
5th STG FD HTR
315 PA
421.8F
Q= 12,085
370.4F
4th STG FD HTR
185 PA
309.8F
h= 1165.4
Q= 27,320
Q= 0
Q= 0
Q= 13,195
MN FD PUMP
VENT
Q=100
DFT
57PG
304.8F
Q= 30,870
Q= 141,099
Q= 0
Q= 202,749
Q= 5,600
353.1F
Q= 25,280
h= 1177.3
Q= 13,180
GLAND LEAK
Q= 50
FIRE PUMP
Q= 13,230
h= 1154.3
Q= 14,140
GLAND LEAK
Q= 90
MN FD PUMP
Q= 14,230
GREASE EXTRACTOR
103.7F
2ND STG FD HTR - PA
103.7 F
1ST STG FD HTR - PA
103.7 F
F
Q=0
Q= 0
Q= 0
F
Q=0
133.3F
Q= 3,687
DISTILLER CONDENSER
0 GPD TO TANKS
F
Q=0
DISTILLING PLANT
DISTILLER AIR EJECT
Q= 0
Q= 0
GLAND LEAK & DFT VENT
Q= 1189
103.7 F
MN AIR EJECTOR
Q= 880
Q= 352
Q= 1,717
Q= 1159
MAIN ENGINE GLAND SEAL
Q= 0
HP TURBINE
LP TURBINE
Q= 344
GLAND LEAK
PA
Q= 0
PA
Q=0
PA
Q= 0
PA
Q= 0
PA
Q= 0
Q= 815
h= 1476.1
830 PG 940 F
Q= 136,850
MAIN COND
88.2F
1.34" HG
Q= 137,060
Q= 118,772
Q=0
CONTROL
LEVEL
Q= 0
87.2F
MN CNDS PUMP
Q= 137,412
DRAIN PUMP
Q= 3,687
Q= 0
FWDCT
Q= 1,970
MAKE UP FEED
SS TURBO GEN
Q= 17,560
Q= 87
GLAND LEAK
Q= 17,473
Q= 17,473
Q= 119,290
Q= 110,640
Q= 8650
C.O.P. TURB 4 IN USE
BALL PUMP TURB
Q= 432
GLAND LEAK
Q= 86
GLAND LEAK
h= 1166.0
Q= 110,208
h= 1258.3
Q= 8,564
Q= 118,772
Q=0
AUX COND
212F
14.7PA
FROM DECK MACHINERY
Q= 4,620
AUX CNDS PUMP
Q = 0
TO CONTAM DRN INSPECT TANK
Q= 4,620
TK CLEANING HTR
DRNN COOLER
Q= 0
Q= 2,039
Q= 0

2166 20

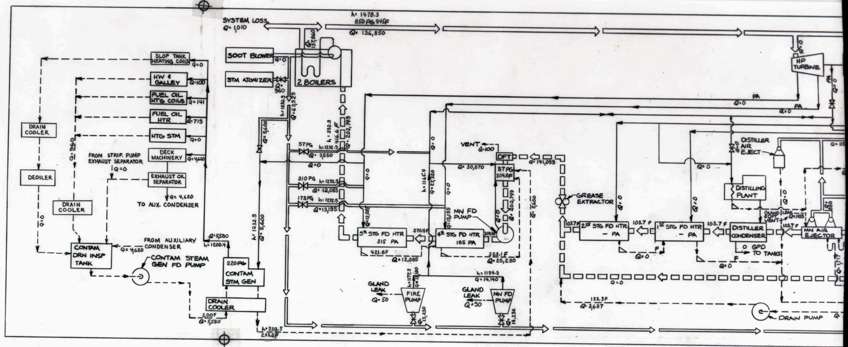
MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

6X

2


SYSTEM LOSS
Q= 1,010
h= 1478.3
850 PG 945F
Q= 136,850
Q= 137,860
SOOT BLOWER
Q=0
STM ATOMIZER
Q= 960
2 BOILERS
SLOP TANK HEATING COILS
Q=0
HW & GALLEY
Q=100
FUEL OIL HTG COILS
Q=141
FUEL OIL HTR
Q=719
HTG STM
Q=0
DECK MACHINERY
Q=4,620
FROM STRIP. PUMP EXHAUST SEPARATOR
Q=0
EXHAUST OIL SEPARATOR
Q= 4,620
TO AUX. CONDENSER
DRAIN COOLER
DEOILER
DRAIN COOLER
Q= 960
Q=0
CONTAM DRN INSP TANK
Q= 4,620
FROM AUXILIARY CONDENSER
CONTAM STEAM GEN FD PUMP
Q=5,580
h=1200.4
220PG
CONTAM STM GEN
DRAIN COOLER
200F
Q= 5,580
h= 203.5
235.2F
h= 1232.9
Q= 63,929
Q= 5,600
h= 1232.9
Q= 5,600
57PG
h=1232.9
Q= 3,550
Q=0
310PG
h= 1232.9
Q= 12,085
175PG
h= 1232.9
Q=13,195
h= 392.9
416.6 F
Q= 202,749
Q=0
Q=12,085
5th STG FD HTR
315 PA
421.8F
Q= 12,085
370.4F
h= 1165.4
Q= 27,320
Q=0
Q=13,195
4th STG FD HTR
185 PA
309.8F
353.1F
Q= 25,280
VENT
Q=100
DFT
57PG
304.8F
Q= 30,870
Q= 141,099
Q=0
Q= 202,749
MN FD PUMP
Q= 5,600
h=1177.3
Q=13,180
h= 1154.3
Q= 14,140
GLAND LEAK
Q= 50
FIRE PUMP
Q= 13,330
GLAND LEAK
Q= 90
MN FD PUMP
Q= 14,230
GREASE EXTRACTOR
103.7F
2ND STG FD HTR
- PA
Q=0
Q=0
F
103.7 F
1ST STG FD HTR
- PA
Q=0
Q=0
F
103.7 F
DISTILLER CONDENSER
0 GPD
TO TANKS
Q=0
DISTILLER AIR EJECT
DISTILLING PLANT
Q=0
Q=0
GLAND LEAK & DFT VENT
Q=1183
103.7 F
MN AIR EJECTOR
Q=880
Q= 1,717
Q= 115
Q=0
133.3F
Q= 3,687
DRAIN PUMP
HP TURBINE
Q=0
PA
Q=0
PA
Q=0
Q=0
PA

216620

MICRO-MASTER 105 mm

K+E

SEPT. '80

6X

3

CSD Vault 79A

REPRODUCTION OFFICE

YARD PRINTS NO GROUPING NO

REMARKS

DATE 4-15-6 SIGNED J H Johnson

	FIRST ISSUE	DEPT.	NO. PRTS.	REV.	DATE ISSUED	SPECIAL PRINTS
YARD PRINTS		AH		A	12-20-74	
		BL		B	4-20-76	
		BR				
		EL				
		FP				
		MI				
		ML				
		MS				
		PC				
		PM				
		PS				
		PN				
		RD				
		RM				
		MIR				
		SH				
		SM				
		TM				
		WD				
		WE				
		WM				
		CSD				
ORDERED BY DESIGN		SEAG/KSD	1			
		JHJ	1			
		LWC	1			
		OR	1			
		JDZ	1			

GROUP: MC NO.

REVISIONS

REV	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D.	OWNER DATE	OWNER APP'D.
A	INITIAL ISSUE	12-13-74	JHJ	–	–
B	DELETED SKETCHES "A-A" & "B-B" & REPLACED WITH NOTE ABOUT LACING.	4/15/76	JHJ	–	–

~~AUTHORITY~~

DWG. REV. — HULL APPLIC.

REV	NN HULLS ONLY [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
A	YES	YES	YES	YES	YES	YES
B	YES	YES	YES	YES	YES	YES

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
—	—	
—	—	
—	—	

APPROVALS

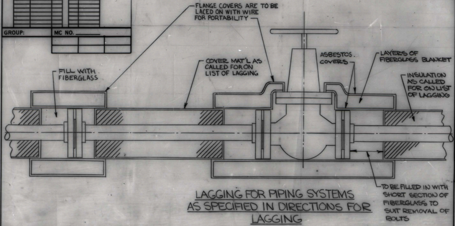
OWNERS	ABS NOT REQ'D
	USCG NOT REQD

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

FSCM NO. 43689

~~DESIGN DIV.~~ MACHINERY DESIGN DEPT.



FLANGE COVERS ARE TO BE LACED ON WITH WIRE FOR PORTABILITY
FILL WITH FIBERGLASS
COVER MAT'L AS CALLED FOR ON LIST OF LAGGING
ASBESTOS COVERS
LAYERS OF FIBERGLASS BLANKET
INSULATION AS CALLED FOR ON LIST OF LAGGING
TO BE FILLED IN WITH SHORT SECTION OF FIBERGLASS TO SUIT REMOVAL OF BOLTS

LAGGING FOR PIPING SYSTEMS AS SPECIFIED IN DIRECTIONS FOR LAGGING

SCALE NONE = 1 FT
DRAWN R.W. TAYLOR
CHECKED JHJ
SECT MGR J H Johnson

DATE COMPL. 12-13-4
EXAMINED E E Johnson
AUTHORIZED E. B. Foster
DATE 12-13-74

TECH APPROVAL NOT REQ'D

C S D APPROVAL EBF FOR J. R. WINSTEAD

MERCHANT STANDARD PORTABLE PADS FOR INSULATING VALVES AND FLANGES

~~U S M A DESIGN~~
~~U S M A DWG NO.~~ ~~HULL NO.~~

DWG NO. 256897 REV B SHEET NO. 1 OF 1

K&E 191253 3-72 2349+

065

MN15-17X22 (REV. 1)

256897

MICRO-MASTER 105 mm K+E

SEPT. '80

6X

257326 CSD VAULT

E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 9-14-78
SIGNED J.H. Johnson

YARD PRINTS — ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS

GROUP
MC NO.

DWG. REV. — HULL APPLIC.

REV.	613	614
A	Yes	Yes
B	Yes	Yes
C	Yes	Yes
D	Yes	Yes
E	YES	YES
F	Yes	Yes
G	Yes	Yes
H	Yes	Yes

NNSB&DDCO HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C 615C	310 309	TI-S-116a	—

APPROVALS
OWNERS NR
ABS NR
USCG NR

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP DESIGN DEPT.

SCALE NONE =1 Ft.
DRAWN W.J. GOUGHTLY
CHECKED J.H.J.
SECT. MGR. J.H. Johnson
DATE COMPL. 12-17-76
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 12-17-76
TECH. APPROVAL NR
CSD APPROVAL R.L. Harrington

TITLE ARR OF MACHINERY ENGINE ROOM LIST OF MATERIAL ⑥

HULL 613C

TYPE OF DWG. —

DWG. NO. 257326 REV H SHEET NO. 1 OF 110

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APPD.
A	—	INITIAL ISSUE				
B	25	ADDED S/M TO L.T. WG	12/17/6	JHJ	—	—
C	31,60	S/M ALTERED	3/24/7	JHJ		
D	21A 22 41 58 63 64 85 86 94 99 103 105 109 106	ADDED LINE 1 DELETED GROUP ALTD ↓ ↓ S/M ALTD GROUP ALTD ↓ ↓ & S/M ALTD ADDED LINE 3 ADDED	4/4/7 11/23/7	JHJ JHJ	— —	— —
E	21A 35 80 92	ALT'D GROUP NO - WAS 6350-0105-1103 6350-0101-2201 PI 2287-0115-1101 SI 6150-0102-1101 SI	2/3/8	JHJ	—	—
F	80	OIL GAGE GROUP DELETED.		JHJ		
G	33 34 104	JACK SHAFTS ADDED.	3/20/8	JHJ	—	—
H	110	ADDED 4 Copies sent to X43 3/7/9	9/14/8	JHJ		

NO.	REFERENCES	DWG. NO.
2	ARR OF MACHINERY-ENG ROOM-SECT & ELEV	257704
1	ARR OF MACHINERY-ENG ROOM- PLAN	257703

HULL NO. 613C, 614C DWG. NO. 257326 SHEET 2 OF

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	①	PORT BOILER	PO ① 6800-C1	MD-M1	

EMARKS -
ERVICE -
APPLICABLE HULLS 613C 614C
GROUP NO. M1-167
6800-0114-1201 SI
DWG NO. 257326 SHEET 3 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	②	STBD BOILER	PO ① 6800-C1	MD-M1	

EMARKS -
ERVICE -
APPLICABLE HULLS 613C 614C
GROUP NO. M1-167
6800-0114-1101-SI
DWG NO. 257326 SHEET 4 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	③	REDUCTION GEAR (*)	PO ① 6100-C1	MD-M1	
	7			(*) FOR FDN BOLTS, NUTS & LINERS SEE N.N. DWG 6100-128			

EMARKS -
ERVICE -
APPLICABLE HULLS 613C 614C
GROUP NO. M1-161
6100-0108-1001-S
DWG NO. 257326 SHEET 5 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	④	THRUST BEARING (*)	PO (1c) 6100-C1	MD-M1	
	7			(*) FOR FDN BOLTS, NUTS & LINERS SEE N.N. DWG 6100-128			

EMARKS -
ERVICE -
APPLICABLE HULLS 613C 614C
GROUP NO. M1-162
6100-0108-1002-SI
DWG NO. 257326 SHEET 6 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	⑤	MAIN CONDENSER (*)	PO ① 6250-C1	MD-M1	
	7			(*) FOR FDN BOLTS, NUTS & LINERS SEE N.N. DWG 6100-128			

EMARKS -
ERVICE -
APPLICABLE HULLS 613C 614C
GROUP NO. M1-160
6250-0108-1001-S
DWG NO. 257326 SHEET 7 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	⑥	L.P. TURBINE (*)	PO (1b) 6100-C1	MD-M1	
	7			(*) FOR FDN BOLTS, NUTS & LINERS SEE N.N. DWG 6100-128			

EMARKS -
ERVICE -
APPLICABLE HULLS 613C 614C
GROUP NO. M1-160
6100-0108-1003-SI
DWG NO. 257326 SHEET 8 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	⑦	H.P. TURBINE (*)	PO (1a) 6100-C1	MD-M1	
	7			(*) FOR FDN BOLTS, NUTS & LINERS SEE N.N. DWG 6100-128			

EMARKS -
ERVICE -
APPLICABLE HULLS 613C 614C
GROUP NO. M1-161
6100-0108-1004-S
DWG NO. 257326 SHEET 9 REV. A

257326

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 1
8X

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	⑧	ATMOSPHERIC COND.(*)	PO ② 6250-C1	MD-M1	
		2						
		3						
		4						
		5						
		6						
		7		(*)	FOR FDN BOLTS, NUTS & LINERS			
		8			SEE N.N. DWG 6100-128			
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

M1-156

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6250-0101-1001-SI 257326	10	A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	⑨	STEADY BEARING(*)	PO ① 6302-C1	MD-M1	
		2						
		3						
		4						
		5						
		6						
		7		(*)	FOR FDN BOLTS, NUTS & LINERS			
		8			SEE N.N. DWG 6100-128			
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

M1-162

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6302-0108-1001-SI 257326	11	A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1		⑩	DIESEL GENERATOR L.O. TANK *	MO 6150-177 S.B L.1	ST-M1	
		2						
		3						
		4						
		5						
		6						
		7		(*)	WELDED TO FDN			
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

M1-158

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6150-0117-1001-PI 257326	12	A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	⑪	STERN TUBE LUBE OIL DRAIN TANK	PO 4F 6302-C2	MD-M1	
		2						
		3						
		4						
		5						
		6						
		7	4	—	½" HEX HEAD BOLT STEEL ZINC PLT L=3"	21-02-274	ST-M1	
		8	4	—	½" HVY HEX NUT STEEL ZINC PLT	21-34-210	↓	
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

M1-148

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6302-0103-1001-PI 257326	13	A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	⑫	BOILER WASHDOWN STRAINER TANK(*)	MO 6150-177 S.6 L.1	ST-M1	
		2						
		3						
		4						
		5						
		6						
		7		(*)	WELDED TO FDN			
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

M1-150

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6150-0106-1001-PI 257326	14	A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	⑬	AFT BILGE SUMP PUMP	PO ⑦ 6350-T16	MD-M1	
		2						
		3						
		4						
		5	4	—	5/8" HEX HEAD BOLT, STEEL ZINC PLT L=1¾"	S/ 21-02-366	ST-M1	
		6	4	—	5/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-214	↓	
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

M1-148

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6350-0103-1001-PI 257326	15	A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	⑭	BILGE & BALLAST PUMP NO. 1 (*)	PO ⑥ 6350-T16	MD-M1	
		2						
		3						
		4						
		5						
		6						
		7		(*)	WELD TO FDN			
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

M1-147

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6350-0102-1201-PI 257326	16	A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	⑮	BILGE & BALLAST PUMP Nº 2 (*)	PO ⑥ 6350-T16	MD-M1	
		2						
		3						
		4						
		5						
		6						
		7		(*)	WELD TO FDN			
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

M1-147

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6350-0103-1202-PI 257326	17	A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	⑯	BILGE & BALLAST PRIMING UNIT(*)	PO ① 6350-T9	MD-M1	
		2		(53)	● BILGE & BALLAST PRIMING TK	PO ② 6350-T9	↓	
		3						
		4						
		5						
		6						
		7		(*)	WELD TO FDN			
		8						
		9		●	BOLTS & NUTS FURN. WITH FDN			
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

M1-159

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6350-0105-1201-PI 257326	18	A

257326

MICRO-MASTER® 105 mm
K+E
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ALEXANDRIA • RICHMOND • NORFOLK
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SEPT. '80

FRAME 1

8X

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	⑰	DIESEL GEN. S.W. PMP	PO ⑥ 6350-T7	MD-M1	
	7	8	—	3/4" HEX HEAD BOLT STEEL ZINC PLT L=2¾"	S/ 21-02-474	ST-M1	
	8	8	—	3/4" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-216	|	

REMARKS -

SERVICE -

Ml-147

APPLICABLE HULLS	613C	614C	GROUP NO.	6350-0102-1202-PI DWG NO. 257326	SHEET 19	REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	⑱	L.O. HEATER	PO ① 6402-C2	MD-M1	
	7	4	—	5/8" HEX HEAD BOLT STEEL ZINC PLT L=1¾"	S/ 21-02-366	ST-M1	
	8	4	—	5/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-214	↓	

REMARKS -

SERVICE -

Ml-157

APPLICABLE HULLS	613C	614C	GROUP NO.	6402-0106-1101-PI DWG NO. 257326	SHEET 20	REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	⑲	L.O. PURIFIER	PO ① 6351-T3	MD-M1	
	7	4	—	5/8" HEX HEAD BOLT STEEL ZINC PLT L=2¾"	S/ 21-02-376	ST-M1	
	8	4	—	5/8 HVY HEX NUT STEEL ZINC PLT	S/ 21-34-214	|	

REMARKS -

SERVICE -

Ml-157

APPLICABLE HULLS	613C	614C	GROUP NO.	6351-0106-1101-PI DWG NO. 257326	SHEET 21	REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	⑳	DISTILLING PLANT FEED PUMP #1	PO ④a 6350-T16	MD-M1	
	6		(*)	WELD TO FDN			

REMARKS -

SERVICE -

APPLICABLE HULLS	613C	614C	GROUP NO.	6350-0106-1103 PI DWG NO. 257326	SHEET 21A	REV. E

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	~~1~~	~~⑳~~	~~DISTILLING PLANT FEED PUMP NO. 1 (*)~~	~~PO ④a 6350-T16~~	~~MD-M1~~	
	2	1	㉑	DISTILLING PLANT FEED PUMP NO. 2 (*)	PO ④ 6350-T16	↓	
	7		(*)	WELD TO FDN			

REMARKS -

SERVICE -

Ml-147

APPLICABLE HULLS	613C	614C	GROUP NO.	6350-0103-1103-PI DWG NO. 257326	SHEET 22	REV. D

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㉒	L.O. SUCTION STRAINER	PO ① 6200-M4	MD-M1	
	7	4	—	1" HEX HEAD BOLT STEEL ZINC PLT L=3"	S/ 21-02-650	ST-M1	
	8	4	—	1" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-220	↓	

REMARKS -

SERVICE -

Ml-147

APPLICABLE HULLS	613C	614C	GROUP NO.	6200-0102-1101-PI DWG NO. 257326	SHEET 23	REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	2	㉖	MAIN L.O. COOLERS	PO ①&② 6402-C1	MD-M1	
	7	16	—	1" HEX HEAD BOLT STEEL ZINC PLT L=2¾"	S/ 21-02-648	ST-M1	
	8	16	—	1" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-220	|	

REMARKS -

SERVICE -

Ml-154

APPLICABLE HULLS	613C	614C	GROUP NO.	6402-0105-1101-PI DWG NO. 257326	SHEET 26	REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㉗	S.W. SERVICE PUMP NO 1 (*)	PO ③ 6350-T16	MD-M1	
	2	1	㉘	S.W. SERVICE PUMP NO 2 (*)	PO ③ 6350-T16	↓	
	7		(*)	WELD TO FDN			

REMARKS -

SERVICE -

Ml-147

APPLICABLE HULLS	613C	614C	GROUP NO.	6350-0101-2204-PI DWG NO. 257326	SHEET 27	REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㉙	S.W. SCRUBBER PUMP NO 1 (*)	PO ② 6350-T16	MD-M1	
	2		㊴	S.W. SCRUBBER PUMP NO 2 (*)	PO ②A 6350-T16	|	
	7		(*)	WELD TO FDN			

REMARKS -

SERVICE -

Ml-147

APPLICABLE HULLS	613C	614C	GROUP NO.	6350-0101-2205-PI DWG NO. 257326	SHEET 28	REV. A

257326

MICRO-MASTER® 105 mm

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SEPT. '80

FRAME 1

8X

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	3	㉚	MN LIGHTING TRANSFORMERS	PO ⑥ 4100-C1	MD-EL	
	2						
	3						
	4						
	5						
	6						
	7	12	—	⅜" HEX HEAD BOLT STEEL ZINC PLT L=1¾"	S/ 21-02-182	ST-EL	
	8	12	—	⅜" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-206		
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS 613C 614C

GROUP NO. EL-167

4100-0112-1003-PI

DWG NO. 257326 SHEET 29 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㉛	MAIN CONDENSATE PUMP NO. 1	PO ② 6350-T7	MD-MI	
	2	1	㉜	MAIN CONDENSATE PUMP NO. 2	PO ② 6350-T7		
	3						
	4						
	5						
	6						
	7	14	—	⅞" HEX HEAD BOLT STEEL ZINC PLT L=4	S/ 21-02-560	ST-MI	
	8	14	—	⅞" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-218		
	9	14	—	½" LINER ABS STEEL 5"x½" THK F.B. L=4½"	S/ 71-30-515	MI	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS 613C 614C

GROUP NO. MI-147

6350-0101-1206-PI

DWG NO. 257326 SHEET 30 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㉝	MN CIRC PUMP NO 1	PO ① 6350-T7	MD-MI	
	2	1	㉞	MN CIRC PUMP NO 2	PO (1A) ~~②~~ 6350-T7		
	3						
	4						
	5						
	6						
	7	12	—	1¼" HEX HEAD BOLT STEEL ZINC PLT L=5"	S/ 21-02-788	ST-MI	
	8	12	—	1¼" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-226		
	9	12	—	½" LINER ABS STEEL 5"x½" THK F.B. L=4½"	S/ 71-30-515	MI	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS 613C 614C

GROUP NO. MI-147

6350-0101-1107-PI

DWG NO. 257326 SHEET 31 REV. ~~A~~C

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㉟	F.O. TRANSFER PUMP	PO. ③ 6350-T8	MD-MI	
	2						
	3						
	4						
	5						
	6						
	7	8	—	⅞" HEX HEAD BOLT STEEL ZINC PLT L=2¾"	S/ 21-02-550	ST-MI	
	8	8	—	⅞" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-218		
	9	8	—	½" LINER ABS STEEL 6"x½" THK. F.B. L=6"	S/ 71-30-860	MI	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS 613C 614C

GROUP NO. MI-142

6350-0101-1001-PI

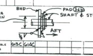
DWG NO. 257326 SHEET 32 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㊱	BALLAST PUMP TURBINE	PO. (1a) 6350-T3	MD-MI	
	2						
	3						
	4						
	5						
	6						
	7	10	—	1" HEX HEAD BOLT STEEL ZINC PLT L=4½"	S/ 21-02-662	ST-MI	
	8	10	—	1" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-220		
	9	10	—	½" LINER ABS STEEL 6"x½" THK F.B. L=4½	S/ 71-30-860	MI	
	10						
	11						
	12	1	(36A)	JACK SHAFT COMPLETE WITH COUPLING & STUFFING BOX	PO ② 6350-C2	ST-MI	
	13	1	(36b)	BHD. MOUNTING PAD FOR STUFFING BOX	MD 257338-3 SH.10 L1		
	14						
	15						
	16						
	17						
	18						

REMARKS -

CUT 17" DIA HOLE IN BHD



SERVICE -

APPLICABLE HULLS 613C 614C

GROUP NO. MI-155

6350-0101-2101-PI

DWG NO. 257326 SHEET 33 REV. G

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㊲	CARGO OIL PUMP TURBINE NO. 1	PO. ① 6350-C4	MD-MI	
	2	1	㊳	CARGO OIL PUMP TURBINE NO. 2			
	3	1	㊴	CARGO OIL PUMP TURBINE NO. 3			
	4	1	㊵	CARGO OIL PUMP TURBINE NO. 4			
	5						
	6						
	7	48	—	1" HEX HEAD BOLT STEEL ZINC PLT L=4½	S/ 21-02-662	ST-MI	
	8	48	—	1" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-220		
	9	48	—	½" LINER ABS STEEL 6"x½" THK F.B. L=4½"	S/ 71-30-860	MI	
	10						
	11						
	12	4	(37A)	*JACKSHAFT COMPLETE WITH COUPLING AND STUFFING BOX	PO ② 6350-C1	ST-MI	
	13	4	(37B)	*BHD MOUNTING PAD FOR STUFFING BOX	MO 257338-3 SH.10 L1		
	14						
	15						
	16						
	17						
	18						

REMARKS - *INSTALL SIMILAR TO SKETCH ON SH.33

SERVICE -

APPLICABLE HULLS 613C 614C

GROUP NO. MI-155

6350-0101-1002-PI

DWG NO. 257326 SHEET 34 REV. G

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㊶	FIRE PUMP	PO ① 6350-T13	MD-MI	
	2						
	3						
	4						
	5						
	6						
	7	10	—	1" HEX HEAD BOLT STEEL ZINC PLT L=4"	S/ 21-02-658	ST-MI	
	8	10	—	1" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-220		
	9	10	—	½" LINER A.B.S. STEEL 6"x½" THK F.B. L=4½"	S/ 71-30-860	MI	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS 613C 614C

GROUP NO. MI-155

6350-0101-2201-PI

DWG NO. 257326 SHEET 35 REV. E

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㊷	EMERGENCY FIRE PUMP	PO ⑤ 6350-T7	MD-MI	
	2						
	3						
	4						
	5						
	6						
	7	5	—	1" HEX HEAD BOLT STEEL ZINC PLT L=4"	S/ 21-02-658	ST-MI	
	8	5	—	1" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-220		
	9	5	—	½" LINER ABS STEEL 6"x½" THK F.B. L=6"	S/ 71-30-860	MI	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS 613C 614C

GROUP NO. MI-147

6350-0101-2203-PI

DWG NO. 257326 SHEET 36 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㊸	MAIN FEED PUMP NO. 1	PO ① 6350-T6	MD-MI	
	2	1	㊹	MAIN FEED PUMP NO. 2	PO ① 6350-T6		
	3						
	4						
	5						
	6						
	7	12	—	1" HEX HEAD BOLT STEEL ZINC PLT L=3½	S/ 21-02-654	ST-MI	
	8	12	—	1" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-220		
	9	12	—	½" LINER ABS STEEL 4"x½" THK F.B. L=5"	S/ 71-30-660	MI	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS 613C 614C

GROUP NO. MI-160

6350-0106-1011-PI

DWG NO. 257326 SHEET 37 REV. A

257326

MICRO-MASTER® 105 mm

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SEPT. '80

FRAME 1

8X

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㊺	F.O. PUMP NO. 1	PO ② 6350-T8	MD-MI	
	2	1	㊻	F.O. PUMP NO. 2	PO ② 6350-T8		
	3						
	4						
	5						
	6						
	7	22	—	7/8" HEX HEAD BOLT " STEEL ZINC PLT L=3½	S/ 21-02-556	ST-MI	
	8	22	—	7/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-218		
	9	22	—	1/2" LINER ABS STEEL 4x1/2" THK F.B. L=4"	S/ 71-30-660	MI	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.			
613C	614C		MI-160	6350-0106-1001-PI		
				DWG NO. 257326	SHEET 38	REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㊼	F.O. SUCTION STRAINER	PO ① 6950-M7	MD-MI	
	2						
	3						
	4						
	5						
	6						
	7	4	—	3/4" HEX HEAD BOLT STEEL ZINC PLT L=2 3/4"	S/ 21-02-474	ST-MI	
	8	4	—	3/4" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-216		
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.			
613C	614C		MI-157	6950-0106-1102-PI		
				DWG NO. 257326	SHEET 39	REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	2	㊽	F.O. HEATERS	PO ① 6402-TS	MD-MI	
	2						
	3						
	4						
	5						
	6						
	7	8	—	7/8" HEX HEAD BOLT " STEEL ZINC PLT L=2¼	S/ 21-02-546	ST-MI	
	8	8	—	7/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-218		
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.			
613C	614C		MI-161	6402-0114-2201-P		
				DWG NO. 257326	SHEET 40	REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㊾	DIESEL OIL PUMP	PO ④ 6350-T8	MD-MI	
	2						
	3						
	4						
	5						
	6						
	7	8	—	5/8" HEX HEAD BOLT STEEL ZINC PLT L=2¼"	S/ 21-02-372	ST-MI	
	8	8	—	5/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-214		
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.			
613C	614C		MI-165	6350-~~0117~~ 0115-1201-PI		
				DWG NO. 257326	SHEET 41	REV. D ~~A~~

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㊿	HYDRAULIC THROTTLE CONTROL ASSY	PO ⑬ 6100-C1	MD-MI	
	2						
	3						
	4						
	5						
	6						
	7	4	—	1/2" HEX HEAD BOLT STEEL ZINC PLT L=2"	S/ 21-02-266	ST-MI	
	8	4	—	1/2" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-210		
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.			
613C	614C		MI-150	6100-105-1001-PI		
				DWG NO. 257326	SHEET 42	REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(51)	MN GLAND EXHAUST FAN	PO ① 6351-M4	MD-MI	
	2						
	3						
	4						
	5						
	6						
	7	4	—	5/8" HEX HEAD BOLT STEEL ZINC PLT L=2"	S/ 21-02-370	ST-MI	
	8	4	—	5/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-214		
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.			
613C	614C		MI-162	6351-0111-1201-PI		
				DWG NO. 257326	SHEET 43	REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(52)	CONDENSATE DE-OILER (*)	PO (1a) 6400-C4	MD-MI	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELD TO 33'-0" LVL			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.			
613C	614C		MI-155	6400-0104-1201-PI		
				DWG NO. 257326	SHEET 44	REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(54)	MN AIR EJECTOR	PO ① 6351-T1	MD-MI	
	2						
	3						
	4						
	5						
	6						
	7	4	—	1 1/8" HEX HEAD BOLT STEEL ZINC PLT L= 4	S/ 21-02-724	ST-MI	
	8	4	—	1 1/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-222		
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.			
613C	614C		MI-155	6351-0104-1201-PI		
				DWG NO. 257326	SHEET 45	REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(55)	CONTAMINATED ST. GEN. (*)	PO (4a) 6402-C2	MD-MI	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELD TO 33'-0" LVL			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.			
613C	614C		MI-155	6402-0104-1101-PI		
				DWG NO. 257326	SHEET 46	REV. A

257326

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FRAME 1

8X

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(56)	STERN TUBE L.O. PRESS CONTROL UNIT *	PO ㊶ 6302-C2	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	
613C	614C		M1-150	6302-106-1004-PI
			DWG NO.	SHEET / REV.
			257326	47 / A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(58)	SLOP TK DR CNDS COOLER	PO (3a) 6402-C2	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	4	—	7/8 HEX HEAD BOLT STEEL ZINC PLT L=2 1/2	S/ 21-02-548	ST-M1	
	8	4	–	7/8 HVY HEX NUT STEEL ZINC PLT	S/ 21-34-218	|	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	
613C	614C		M1-155	6402-0104-1202-PI
			DWG NO.	SHEET / REV.
			257326	48 / A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(59)	CONTROL AIR COMP MODULE	PO ① 6351-CS	MD-M1	
	2	6	—	3/4" HEX HEAD BOLT STEEL ZINC PLT L=2 1/4"	S/ 21-02-470	ST-M1	
	3	6	—	3/4" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-216	|	
	4						
	5						
	6	1	(60)	CONTROL AIR RECEIVER	PO ② 6351-CS	MD-M1	
	7						
	8						
	9						
	10	1	(61)	CONTROL AIR REFRIGIFILTER NO. 1	PO ③ 6351-CS	MD-M1	
	11	1	(108)	CONTROL AIR REFRIGIFILTER NO. 2	PO ③ 6351-CS	|	
	12	8	—	1/4" HEX HEAD BOLT STEEL ZINC PLT L= 1 1/2	S/ 21-02-048	ST-M1	
	13	8	—	1/4" HVY HEX NUT STEEL	S/ 21-34-202	|	
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	
613C	614C		M1-155	6351-0104-1102-PI
			DWG NO.	SHEET / REV.
			257326	49 / A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(63)	SEWAGE TREATMENT PLANT (*)	PO ① 2504-C1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELD TO 33'-0" LVL			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	
613C	614C		M1-157	2504-0104-1201-PI
			DWG NO.	SHEET / REV.
			257326	50 / A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(64)	1ST & 2ND STG FEED HTR	PO ①&② 6400-T1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	8	—	1" HEX HEAD BOLT. STEEL ZINC PLT L=2 3/4	S/ 21-02-648	ST-M1	
	8	8	–	1" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-220	↓	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	
613C	614C		M1-161	6400-0113-1202-PI
			DWG NO.	SHEET / REV.
			257326	51 / A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(66)	BOILER WTR TEST CABINET (*)	PO ① 6557-C1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	
613C	614C		M1-178	6557-0114-1101-SI
			DWG NO.	SHEET / REV.
			257326	52 / A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㉓	L.O. DISCHARGE STRAINER	P.O. ② 6200-M4	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	4	–	1" HEX HEAD BOLT STEEL ZINC PLT L=3"	S/ 21-02-650	ST-M1	
	8	4	–	1" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-220	↓	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	
613C	614C		M1-154	6200-0105-1101-PI
			DWG NO.	SHEET / REV.
			257326	24 / A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	㉔	L.O. SERVICE PUMP Nº 1	PO ① 6350-T8	MD-M1	
	2	1	㉕	L.O. SERVICE PUMP Nº 2	PO ① 6350-T8	↓	
	3						
	4						
	5						
	6						
	7	8	—	1 1/2" HEX HEAD BOLT STEEL ZINC PLT L=8"	PO ㉖ 6000-C13	MD-M1	
	8	8	–	1 1/2" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-234	ST-M1	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	
613C	614C		M1-147	6350-0102-1104-PI
			DWG NO.	SHEET / REV.
			257326	25 / B

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(67)	4TH & 5TH STG FEED HTR	PO ③&④ 6400-T1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	8	—	1" HEX HEAD BOLT. STEEL ZINC PLT L=2 3/4	S/ 21-02-648	ST-M1	
	8	8	—	1" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-220	|	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	
613C	614C		M1-161	6400-0113-1101-PI
			DWG NO.	SHEET / REV.
			257326	53 / A

257326

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FRAME 1

8X

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FRAME 1
8X

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(68)	DISTILLING PLANT NO 1 (*)	PO ① 6401-C1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED TO 60'-0" LVL			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

m1-161

APPLICABLE HULLS	GROUP NO.	DWG NO.	SHEET	REV.
613C 614C		6401-0115-1101-PI 257326	54	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(69)	DISTILLING PLANT NO.2 (*)	PO ② 6401-C1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED TO 60'-0" LVL			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

m1-161

APPLICABLE HULLS	GROUP NO.	DWG NO.	SHEET	REV.
613C 614C		6401-0113-1101-PI 257326	55	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(70)	POTABLE WTR PUMP NO 1 (*)	PO ⑤ 6350-T16	MD-M1	
	2	1	(71)	POTABLE WTR PUMP NO 2 (*)	PO ⑤ 6350-T16	|	
	3						
	4						
	5						
	6						
	7		(*)	WELDED TO FDN			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

m1-161

APPLICABLE HULLS	GROUP NO.	DWG NO.	SHEET	REV.
613C 614C		6350-0115-1101-PI 257326	56	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(72)	HOT WATER HEATER (*)	PO ② 6402-T2	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED TO 60'-0" LVL			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

m1-158

APPLICABLE HULLS	GROUP NO.	DWG NO.	SHEET	REV.
613C 614C		6402-0115-1101-PI 257326	57	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(73)	POTABLE WATER TANK (*)	PO ① 2350-C6	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

m1-161

APPLICABLE HULLS	GROUP NO.	DWG NO.	SHEET	REV.
613C 614C		0110 2350-~~0115~~-1101-PI 257326	58	D ~~A~~

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(74)	MN ENGINE CONSOLE (*)	PO ① 6755-M1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

m1-173

APPLICABLE HULLS	GROUP NO.	DWG NO.	SHEET	REV.
613C 614C		6755-0115-1001-SI 257326	59	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(75)	SWITCHBOARD (*)	PO ① 4050-C[illegible] 1A	MD-EL	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

EL-169

APPLICABLE HULLS	GROUP NO.	DWG NO.	SHEET	REV.
613C 614C		4100-0115-1003-SI 257326	60	~~A~~ C

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(76)	A/C UNIT (*)	PO ① 2670-C2	MD-M1	
	2	1	(77)	A/C UNIT (*)	PO ① 2670-C2	|	
	3						
	4						
	5						
	6						
	7		*	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

m1-168

APPLICABLE HULLS	GROUP NO.	DWG NO.	SHEET	REV.
613C 614C		2670-0115-1001-SI 257326	61	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(79)	AUX. CONDENSATE PUMP NO 2	PO (3A) 6350-T7	MD-M1	
	2	1	(138)	AUX CONDENSATE PUMP NO 1	PO (3A) 6350-T7	|	
	3						
	4						
	5						
	6						
	7	14	—	7/8" HEX HEAD BOLT STEEL ZINC PLT L=4"	S/ 21-02-560	ST-M1	
	8	14	—	7/8 HVY HEX NUT STEEL ZINC PLT	S/ 21-34-218	|	
	9	14	—	1/2" LINER ABS STEEL 3"x1/2" THK F.B. L=4"	S/ 71-30-515	M1	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

m1-147

APPLICABLE HULLS	GROUP NO.	DWG NO.	SHEET	REV.
613C 614C		6350-0101-2206-PI 257326	62	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(80)	(*) A/C COMPRESSOR Nº 1	PO ① 2670-C1	MD-M1	
	2	1	(81)	(*) A/C COMPRESSOR Nº 2	PO ① 2670-C1	|	
	3						
	4						
	5						
	6						
	7		(*)	WELDED TO FDN			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	DWG NO.	SHEET	REV.
	613C	614C	m1-164	2670-0117-1201-~~SI~~ PI 257326	63	D ~~A~~

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(82)	(*) REFRIG COMPRESSOR Nº 1	PO ② 2670-C1	MD-M1	
	2	1	(83)	(*) REFRIG COMPRESSOR Nº 2	PO ② 2670-C1	|	
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	DWG NO.	SHEET	REV.
	613C	614C	m1-164	2670-0117-1101-~~SI~~ PI 257326	64	D ~~A~~

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(84)	FORCED DRAFT BLOWER Nº 1	PO ① 6901-C1	MD-OB	
	2	1	(85)	FORCED DRAFT BLOWER Nº 2	|	|	
	3	1	(86)	FORCED DRAFT BLOWER Nº 3	|	|	
	4	1	(87)	FORCED DRAFT BLOWER Nº 4	↓	|	
	5						
	6						
	7	44	—	⅜" HEX HEAD BOLT STEEL ZINC PLT L=2½	S/ 21-02-194	ST-OB	
	8	44	—	⅜" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-206	|	
	9	44	—	½" LINER ABS STEEL 4x½" THK FB L=4"	S/ 71-30-660	OB	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	DWG NO.	SHEET	REV.
	613C	614C	OB-186	6901-1601-1001-PI 257326	65	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(88)	REGENERATIVE AIR HTR Nº 1	PO (1A) 6800-C1	MD-M1	
	2	1	(89)	REGENERATIVE AIR HTR Nº 2	PO (1A) 6800-C1	|	
	3						
	4						
	5						
	6						
	7	24	—	1" HEX HEAD BOLT STEEL ZINC PLT L=3½	S/ 21-02-654	ST-M1	
	8	8	—	FITTED BOLTS STEEL (T.F.W.)	MO 283097 S.4 L.1	|	
	9	32	—	1" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-220	M1	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	DWG NO.	SHEET	REV.
	613C	614C	m1-178	6800-1601-1001-PI 257326	66	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(90)	DEAERATING FEED TK (*)	PO (1A) 6400-T2	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	DWG NO.	SHEET	REV.
	613C	614C	m1-178	6400-1601-1001-PI 257326	67	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(91)	INERT GAS PLANT (*)	PO ① 2730-C1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	DWG NO.	SHEET	REV.
	613C	614C	m1-178	2730-1601-1008-PI 257326	68	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(92)	HYDRAULIC VALVE CONTROL (*)	PO ① 2300-C1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	DWG NO.	SHEET	REV.
	613C	614C	m1-178	2300-1601-1001-PI 257326	69	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(93)	L.O. GRAVITY TANK (*)	MO 6150-177 S.11 L.1	ST-M1	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	DWG NO.	SHEET	REV.
	613C	614C	m1-170	6150-1601-1001-PI 257326	70	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(95)	S.S. TURBO GENERATOR	PO (1A) 4000-C1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	6	—	1½" HEX HEAD BOLT STEEL BLACK L=5½	S/ 21-14-430	ST-M1	
	8	4	—	FITTED BOLTS STEEL (T.F.W.)	MO 283097 S.4 L.2	|	
	9	10	—	1" LINERS ABS STEEL 6"X1" THK F.B. L=8	S/ 71-30-875	M1	
	10	10	—	1½ HVY HEX NUT STEEL ZINC PLT	S/ 21-34-234	ST-M1	
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

APPLICABLE HULLS			GROUP NO.	DWG NO.	SHEET	REV.
	613C	614C	m1-167	4000-0115-1201-SI 257326	71	A

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FRAME 1

8X

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(96)	(*) F.W. TRANSFER PUMP Nº 1.	PO ① 6350-T16	MD-ml	
	2	1	(97)	(*) F.W. TRANSFER PUMP Nº 2.	PO ① 6350-T16	│	
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-135

APPLICABLE HULLS	613C	614C	GROUP NO.		DWG NO.	SHEET	REV.
					6350-0101-2202-PI 257326	72	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(98)	F.W. DRAIN TANK (*)	MO 6150-177 S.15.L.1	ST-ml	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-156

APPLICABLE HULLS	613C	614C	GROUP NO.		DWG NO.	SHEET	REV.
					6150-0104-2201-PI 257326	73	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(99)	S.S. AIR COMPRESSOR MODULE (*)	PO ① 6351-C2	MD-ml	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-155

APPLICABLE HULLS	613C	614C	GROUP NO.		DWG NO.	SHEET	REV.
					6351-0104-1103-PI 257326	74	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(100)	HARBOR FEED PUMP	PO ① 6350-C18	MD-ml	
	2						
	3						
	4						
	5						
	6						
	7	8	—	3/4" HEX HEAD BOLT STEEL ZINC PLT L=9"	S/ 21-02-520	ST-ml	
	8	8	—	3/4" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-216	│	
	9	8	—	1/2" LINER ABS STEEL 4x1/2" THK F.B L=4"	S/ 71-30-660	ml	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-163

APPLICABLE HULLS	613C	614C	GROUP NO.		DWG NO.	SHEET	REV.
					6350-0105-1011-SI 257326	75	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(101)	DIESEL GENERATOR	PO ① 4002-C1	MD-ml	
	2						
	3						
	4						
	5						
	6						
	7	12	—	1 3/8" HEX HEAD BOLT STEEL BLACK L=5 1/2	S/ 21-14-420	ST-ml	
	8	12	—	1 3/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-230	│	
	9	12	—	1" LINERS ABS STEEL 6x1/2" THK F.B. L=10"	S/ 71-30-860	ml.	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-168

APPLICABLE HULLS	613C	614C	GROUP NO.		DWG NO.	SHEET	REV.
					4002-0113-1201-SI 257326	76	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(102)	BILGE OILY/WATER SEP. (*)	PO ② 2400-C1	MD-ml	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-163

APPLICABLE HULLS	613C	614C	GROUP NO.		DWG NO.	SHEET	REV.
					2280-0105-1202-SI 257326	77	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(103)	EMERGENCY SEWAGE PUMP Nº 1 (*)	PO ① 2504-T2	MD-ml	
	2	1	(104)	EMERGENCY SEWAGE PUMP Nº 2 (*)	PO ① 2504-T2	│	
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-159

APPLICABLE HULLS	613C	614C	GROUP NO.		DWG NO.	SHEET	REV.
					2504-0105-1201-PI 257326	78	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(106)	OILY/WATER SEPARATOR BILGE PUMP	PO (2a) 2400-C1	MD-ml	
	2						
	3						
	4						
	5						
	6						
	7	4	—	3/8" HEX HEAD BOLT STEEL ZINC PLT L=1 3/4"	S/ 21-02-186	ST-ml	
	8	4	—	3/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-206	│	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-165

APPLICABLE HULLS	613C	614C	GROUP NO.		DWG NO.	SHEET	REV.
					2280-0103-1101-PI 257326	79	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	~~1~~	~~(107)~~	~~OIL TANK LEVEL GAGES~~	~~PO ① 2287-C1~~	~~MD-ml~~	
	2						
	3						
	4						
	5						
	6						
	7	~~4~~	~~—~~	~~1/2" HEX HEAD BOLTS STEEL ZINC PLT L=2"~~	~~S/ 21-02-266~~	~~ST-ml~~	
	8	~~4~~	~~—~~	~~1/2 HVY HEX NUT STEEL ZINC PLT~~	~~S/ 21-34-210~~	~~│~~	
	9						
	10						
	11			THIS ITEM IS GROUPED			
	12			ON DWG. 2287-145			
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-174

APPLICABLE HULLS	613C	614C	GROUP NO.		DWG NO.	SHEET	REV.
					~~2287-0115-1101-SI~~ 257326	80	F

257326

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FRAME 1

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FRAME 1
8X

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(109)	SOOT BLOWER NO. 1(P) (*)	PO ⑬ 6800-C1	MD-ml	
	2						
	3						
	4						
	5						
	6						
	7		(*)	BOLTS & NUTS FURD WITH FDN			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-173

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6800-0118-1201-SI 257326	81	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(110)	SOOT BLOWER NO. 1(S) (*)	PO ⑬ 6800-C1	MD-ml	
	2						
	3						
	4						
	5						
	6						
	7		(*)	BOLTS & NUTS FURD WITH FDN			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-173

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6800-0118-1101-SI 257326	82	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(111)	SOOT BLOWER NO. 2(P) (*)	PO ⑬ 6800-C1	MD-ml	
	2						
	3						
	4						
	5						
	6						
	7		(*)	BOLTS & NUTS FURD WITH FDN			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-167

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6800-0114-1202-SI 257326	83	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(112)	SOOT BLOWER NO. 2(S) (*)	PO ⑬ 6800-C1	MD-ml	
	2						
	3						
	4						
	5						
	6						
	7		(*)	BOLTS & NUTS FURN WITH FDN			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-167

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6800-0114-1102-SI 257326	84	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(113)	BOILER CONTROL PANEL (*)	PO ② 6755-C1	MD-ml	
	2						
	3						
	4						
	5						
	6						
	7		(*)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-168

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6755-~~[illegible]~~ 0114-1001-SI 257326	85	D ~~A~~

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(114)	AUX S.W. CIRC. 8" DUPLEX STRAINER	PO ① 6550-M13	MD-ml	
	2						
	3						
	4						
	5						
	6						
	7	3	—	7/8" HEX HEAD BOLT STEEL ZINC PLT L= 2"	S/ 21-02-544	ST-ml	
	8	3	—	7/8" HEX HEAD BOLT STEEL ZINC PLT L=1 1/2"	S/ 21-02-540	|	
	9	3	—	1/2" LINERS ABS STEEL 2 x 1/2" THK F.B L=4"	S/ 71-30-345	ml	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-157

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				6550-0104-1201-PI 257326	86	D ~~A~~

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(115)	SEWAGE TANK BLOWER	PO. ① 2504-C4	MD-ml	
	2						
	3						
	4						
	5						
	6						
	7	4	—	5/8" HEX HEAD BOLT STEEL ZINC PLT L=1 3/4"	S/ 21-02-366	ST-ml	
	8	4	—	5/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-214	|	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

ml-159

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				2504-0105-1202-PI 257326	87	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(117)	CONTROLLER FOR EMER. FIRE PUMP	PO (9A) 6350-C15	MD-EL	
	2	4	—	5/8" HEX HEAD BOLT STEEL ZINC PLT L=2 1/4"	S/ 21-02-372	ST-EL	
	3	4	-	5/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-214	|	
	4	1	(118)	CONTROLLER FOR MAIN CIRC PUMP Nº 1	PO (1B) 6350-C15	MD-EL	
	5	1	(119)	CONTROLLER FOR MAIN CIRC PUMP Nº 2	↓	|	
	6	1	(125)	CONTROLLER FOR MAIN CNDS PUMP Nº 1	PO (2B) 6350-C15	|	
	7	1	(126)	CONTROLLER FOR MAIN CNDS PUMP Nº 2	↓	|	
	8	16	—	1/2" HEX HEAD BOLT STEEL ZINC PLT L=2"	S/ 21-02-266	ST-EL	
	9	16	—	1/2 HVY HEX NUT STEEL ZINC PLT	S/ 21-34-210	|	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

EL 165

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				4100-0104-1003-SI 257326	88	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(120)	POWER SUPPLY CATHODIC PROTECTION PANEL Nº 1.	PO 2A ⊕ 4100-CS	MD-EL	
	2	1	(137)	POWER SUPPLY CATHODIC PROTECTION PANEL Nº 2	PO 2A ⊕ 4100-CS	|	
	3						
	4						
	5						
	6						
	7	8	—	1/2" HEX HEAD BOLT STEEL ZINC PLT L=8 1/2	S/ 21-02-378	ST-EL	
	8	8	—	1/2" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-210	|	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

EL 160

APPLICABLE HULLS	613C	614C	GROUP NO.	DWG NO.	SHEET	REV.
				4100-0106-1001-P. 257326	89	A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(121)	DIESEL START (✻) AIR RECEIVER Nº1	PO ③ 4002-C1	MD-M1	
	2	1	(122)	DIESEL START AIR RECEIVER Nº2 (✻)	↓	|	
	3						
	4						
	5						
	6						
	7		(✻)	BOLTS & NUTS FURN WITH FDN			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

MI-164

APPLICABLE HULLS: 613C 614C

GROUP NO.

DWG NO. 4002-0117-1201-PI

257326 SHEET 90 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(123)	USED OIL TANK (✻)	NO 6150-177 S.3 L.1	ST-M1	
	2						
	3						
	4						
	5						
	6						
	7		(✻)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

MI-157

APPLICABLE HULLS: 613C 614C

GROUP NO.

DWG NO. 6150-0106-1102-PI

257326 SHEET 91 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(124)	LUBE OIL PURIFIER DRAIN TANK (✻)	NO 6150-177 S.4 L.1	ST-M1	
	2						
	3						
	4						
	5						
	6						
	7		(✻)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

MARKS -

ERVICE -

MI-157

APPLICABLE HULLS: 613C 614C

GROUP NO.

DWG NO. 6150-0102-1101-SI

257326 SHEET 92 REV. E

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(127)	CHEMICAL FEED TANK	PO (10) 6401-C1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	4	—	1/2" HEX HEAD BOLT STEEL ZINC PLT L= 1 3/4"	S/ 21-02-264	ST-M1	
	8	4	—	1/2 HVY HEX NUT STEEL ZINC PLT	21-34-210	↓	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

MI-161

APPLICABLE HULLS: 613C 614C

GROUP NO.

DWG NO. 6401-0115-1101-SI

257326 SHEET 93 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(128)	GREASE EXTRACTOR	PO ① 6400-T3	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	4	—	1" HEX HEAD BOLT STEEL ZINC PLT L=3 1/2	S/ 21-02-654	ST-M1	
	8	4	—	1" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-220	|	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

MI-164

APPLICABLE HULLS: 613C 614C

GROUP NO.

DWG NO. 6400-0117-1201-PI

257326 SHEET 94 REV. D

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(129)	AIR FILTER FOR AUX DIESEL GEN.	PO (12) 4002-C1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	4	—	1/2" HEX HEAD BOLT STEEL ZINC PLT L=2"	S/ 21-02-226	ST-M1	
	8	4	—	1/2" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-210	|	
	9						
	10						
	11						
	12						
	13						
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	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

MI-164

APPLICABLE HULLS: 613C 614C

GROUP NO.

DWG NO. 4002-0117-1202-PI

257326 SHEET 95 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(130)	AMINE INJECTOR	PO ① 6553-C1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	3	—	1/2 HEX HEAD BOLT STEEL ZINC PLT L=2"	S/ 21-02-226	ST-M1	
	8	3	—	1/2 HVY HEX NUT STEEL ZINC PLT	S/ 21-34-210	|	
	9						
	10						
	11						
	12						
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	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

MI-161

APPLICABLE HULLS: 613C 614C

GROUP NO.

DWG NO. 6552-0114-1101-PI

257326 SHEET 96 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(131)	S.W. STR FOR AUX DIESEL GEN. COOL	PO ② 6550-M13	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	6	—	3/4" HEX HEAD BOLT STEEL ZINC PLT L=1 1/2	S/ 21-02-462	ST-M1	
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

EMARKS -

ERVICE -

MI-161

APPLICABLE HULLS: 613C 614C

GROUP NO.

DWG NO. 6550-0114-1201-PI

257326 SHEET 97 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(132)	WATERTIGHT SLIDING DOOR	PO ① 2212-C1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7						
	8						
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	17						
	18						

EMARKS -

ERVICE -

MI-176

APPLICABLE HULLS: 613C 614C

GROUP NO.

DWG NO. 2212-0405-1001-SI

257326 SHEET 98 REV. A

257326

MICRO-MASTER® 105 mm
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SEPT. '80

FRAME 1

8X

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(133)	DEIONIZER (✱)	PO ① 6552-C~~8~~ 17	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7		(✱)	WELDED TO FDN			
	8						
	9						
	10						
	11						
	12						
	13						
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	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

m1-157

APPLICABLE HULLS	613C	614C	GROUP NO.	6552-~~0104~~ 0105-1203-PI
			DWG NO. 257326	SHEET 99 REV. D ~~A~~

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(34)	AIR REFRIGIFILTER FOR SOOTBLOWERS & VAC. STRIP	PO. ① 6454-C7	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	4	—	3/8" HEX HEAD BOLT STEEL ZINC PLT L=1 1/2"	S/ 21-02-184	ST-M1	
	8	4	—	3/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-206	│	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

m1-157

APPLICABLE HULLS	613C	614C	GROUP NO.	6454-0104-1201-P.
			DWG NO. 257326	SHEET 100 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(35)	AUX GLAND EXHAUST CONDENSER	PO (5A) 6402-C2	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	4	—	7/8" HEX HEAD BOLT STEEL ZINC PLT L=2 1/2"	S/ 21-02-548	ST-M1	
	8	4	—	7/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-218	│	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

m1-155

APPLICABLE HULLS	613C	614C	GROUP NO.	6402-0104-1203-F
			DWG NO. 257326	SHEET 101 RE A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(140)	FWD BILGE SUMP PUMP	PO (7A) 6350-T16	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	4	—	5/8" HEX HEAD BOLT STEEL ZINC PLT L=1 3/4"	S/ 21-02-366	ST-M1	
	8	4	—	5/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-214	│	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

m1-147

APPLICABLE HULLS	613C	614C	GROUP NO.	6350-0101-1004-PI
			DWG NO. 257326	SHEET 102 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(145)	PORT PUMP ROOM FAN MOTOR	PO ㊳ 6350-C14	MD-OB	
	2	1	(146)	STBD PUMP ROOM FAN MOTOR	↓		
	3						
	4						
	5						
	6						
	7	8	—	5/8" HEX HEAD BOLT STEEL ZINC PLT L=3"	S/ 21-02-380	ST-OB	
	8	8	—	5/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-214	│	
	9	8	—	1/2" LINERS ABS STEEL 3"x1/2" THK F.B. L=3"	S/ 71-30-515	OB	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

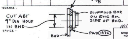
OB-157

APPLICABLE HULLS	613C	614C	GROUP NO.	6350-~~0104~~ 0110-1002PI
			DWG NO. 257326	SHEET 103 REV. D ~~A~~

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	5	(147)	MOTORS FOR VAC-STRIP PUMP	PO PART OF ③ (4) 6350-T1 PO PART OF ③ (1) 6350-T2	MD-M1	
	2	4	(147A)	BHD. STFG. BOX @ SPLIT STFG. BOX, JACK SHAFT & COUPLINGS	PO 6350-T1 PART OF ③	ST-M1	
	3	1	(147b)	↓	PO 6350-T2 PART OF ③	│	
	4	5	(147C)	STUDED PAD FOR BHD STUFFING BOX	MO 216707-6 SH.11 L-9	↓	
	5						
	6						
	7	20	—	1/2" HEX HEAD BOLT STEEL ZINC PLT L=2 3/4"	S/ 21-02-272	ST-M1	
	8	20	—	1/2" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-210	│	
	9	20	—	1/2" LINERS ABS STEEL 3"x1/2 THK F.B. L=3"	S/ 71-30-515	M1	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -


3/8
CUT ABT 9" DIA HOLE IN BHD
STUFFING BOX ON ENG RM. SIDE OF BHD.
PAD (147C)
BHD

SERVICE -

m1-157

APPLICABLE HULLS	613C	614C	GROUP NO.	6350-0104-1001-PI
			DWG NO. 257326	SHEET 104 REV. G

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(148)	STERN TUBE LO (✱) CIRCOOLMATIC UNIT	PO ⑤ 6302-C2	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7		(✱)	WELDED TO FDN			
	8						
	9						
	10						
	11						
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	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

m1-158

APPLICABLE HULLS	613C	614C	GROUP NO.	6302-~~0101~~ 0106-1201-~~PI~~ SI
			DWG NO. 257326	SHEET 105 REV. D ~~A~~

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(149)	BALLAST OVBD (✱) SAMPLING PUMP #3 ~~(PORT)~~	PO (2A) 2400-C22	MD-M1	
	2	1	(150)	BALLAST OVBD (✱) SAMPLING PUMP #1 ~~(STBD)~~	↓	↓	
	3	1	(155)	↓ #2	↓		
	4						
	5						
	6						
	7		(✱)	WELDED			
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

m1-155

APPLICABLE HULLS	613C	614C	GROUP NO.	2280-0104-1002-PI
			DWG NO. 257326	SHEET 106 REV. D ~~A~~

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	(151)	TOXION INJECTION UNIT	PO ② 6553-C1	MD-M1	
	2						
	3						
	4						
	5						
	6						
	7	2	—	3/8" HEX HEAD BOLT STEEL ZINC PLT L=2"	S/ 21-02-188	ST-M1	
	8	2	—	3/8" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-206	│	
	9						
	10						
	11						
	12						
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	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

m1-165

APPLICABLE HULLS	613C	614C	GROUP NO.	6552-0105-1201-
			DWG NO. 257326	SHEET 107

257326

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FRAME 1

8X

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	(152)	STERN TUBE LUBE OIL HEAD TANK	PO (4a) 6302-C2	MD-MI	
		2						
		3						
		4						
		5						
		6						
		7	4	—	3/4" HEX HEAD BOLT STEEL ZINC PLT L=3"	S/ 21-02-476	ST-MI	
		8	4	—	3/4" HVY HEX NUT STEEL ZINC PLT	S/ 21-34-216	|	
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE –

m1-150

APPLICABLE HULLS	613C	614C						GROUP NO.	6302-0106-1003-PI	
									DRG NO. 257326	SHEET 108	REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	(154)	AE & OVFL CONTAINMENT TANK	MD 283206 SH.6 L.1	ST-MI	
		2						
		3						
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
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		15						
		16						
		17						
		18						

REMARKS –

SERVICE –

APPLICABLE HULLS	613C	614C	GROUP NO.	6150-0118-1001 PI
			DRG NO. 257326	SHEET 109	REV. D

& OUTFITTING GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	(161)	AUX. LUBE OIL TRANS. PUMP	PO ① 6350-C54	MD-MI	
		2	8	—	BOLTS 5/8" HEX HD 2 1/4" LONG	S 21-02-372	ST-MI	
		3	8	—	NUTS, 5/8" HEX	S 21-34-214	ST-MI	
		4						
		5						
		6						
		7						
		8						
		9						
		10						
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		16						
		17						
		18						

REMARKS –

SERVICE –

APPLICABLE HULLS	613C	614C	GROUP NO.	6350-0101-1108 PI
			DRG NO. 257326	SHEET 110	REV. H

257326

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SEPT. '80
FRAME 1
8X

CSD VAULT

257331

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APP'D.
		SEE SHEET 2				

NOTE: ALL MATERIAL IS TO BE PROVIDED BY PAINT DEPT EXCEPT AS NOTED.

REV. STATUS OF SHEETS

REV.	E	E	D	B	B	B	B	B	C	B	E	B	B	B	B	B	B	B
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

GROUP

MC NO.

PARTIAL ISSUE
SHEETS 1, 2, 11 ONLY

DWG. REV. — HULL APPLIC.

REV.	NN HULLS ONLY 613C	614C	615C
A	YES	YES	YES
B	YES	YES	NO
C	YES	YES	NO
D	YES	YES	NO
E	YES	YES	NO

NNS & DD Co. HULL NO.	MARAD HULL NO.	USMA DESIGN	SHIP'S NAME
615C	311		
614C	310		
613C	309	T11-S-116A	

APPROVALS

OWNERS: TRANS No. 2180V dtd 3-19-79

ABS: NOT REQ'D

USCG: NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
TENNECO
Commercial Ship Division
FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING

SCALE: NONE = 1 Ft.
DRAWN: W. D. Burton, Jr.
CHECKED: E W Buckingham 3-3-8
SECT. MGR. J H Johnson

DATE COMPL. 3-3-78
EXAMINED: —
AUTHORIZED: A. Conley
DATE 3-3-78

TECH. APPROVAL: NOT REQ'D

CSD APPROVAL: R. L. Harrington

TITLE

LIST OF LUBRICANTS

DWG. NO. 257331

REVISION E

SHEET NO. 1 OF 18

M7 11 X 17

TYPE OF DWG. —

REPRODUCTION OFFICE

YARD PRINTS YES GROUPING NO

REMARKS Send copies to Paint Dept.

DATE 11-21-79 SIGNED J H Johnson

SPECIAL PRINTS

REV.	DATE ISSUED
A	4.6.78
B	2.14.79
C	6.8.79
D	7.5.79
E	11.28.79

YARD PRINTS

FIRST ISSUE	DEPT.	NO. PRINTS
	AH	
	BL	
	BR	
	EL	
	FP	
4.6.78	MI	4
	ML	
	MS	
	PC	
	PM	
4.6.78	PS	12
	PN	
	RD	
	RM	
	MIR	
	SH	
	SM	
	TM	
	WD	
	WE	
	WM	
	X16	
11.28.79	PT	2

ORDERED BY DESIGN

FIRST ISSUE	DEPT.	NO. PRINTS
4.6.78	SEPIA/RO	1
	CSD-V	1
	JHJ	1
	JCP	1
	JEA	1
	MEM	1
	LWC	1
	RGH	1
	ORSHELL	2
	X62E	2

GROUPED: BY / CHK.

DATES: PART / COMP.

HULL 613C KEY / GROUP NO.

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SEPT. '80

4X

REVISIONS

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		USN	
N N	NAVSHIPS					DATE	AUTHD	DATE	APPD
		A	-	-	INITIAL ISSUE	3/3/78	JKJ	—	—
		B	3	1,14	COL 7 - ALT FROM SHELL TURBO 37 TO SUIT METRIC DESIGNATION.				
			6	15	COL 3 - QUANTITY WAS 2.				
			16 17 18	1,2 4 7-10 ALL ALL	COL 8 - INFORMATION SHOWN WAS IN COLUMN 7. ↓ ↓ ↓ ↓ ↓				
			ALL	-	ADDED INFORMATION IN COLUMN 7 TO SUIT OWNERS COMMENTS				
			ALL	-	SHEETS GENERALLY REVISED TO INCORPORATE VENDOR'S DATA. GER	2/7/9	AC JKJ	—	-
		C	11	5	ADDED INFORMATION FOR VAC-STRIP SYSTEM.			—	—
			1		ADDED OWNERS APPROVAL				
			9	1	ADDED HYDRAULIC FLUID DATA	6/4/79	LWL		
		D	3	6A	ADDED INFORMATION FOR ITC SYS	6/26/79	LWL	-	-
		E	11	3	SHELL TURBO 150 WAS SHELL TURBO 100	11/21/9	LWL		

HULL NO. 613C, 614C, 615C	DWG. NO. 257331	REV. D	SHEET 2

MN11-11 X 17 (REV. 1)

K&E 19 1253 10-71 2236•

257331

MICRO-MASTER® 105 mm
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4X

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	EQUIPMENT			LUBRICANT						LOCAL USE ONLY			
PRINTS	NAME	NO. PER SHIP	MFR.	USED FOR (SUB-COMPONENT)	KIND	REPLACEMENT LUBRICANT OWNERS SPEC. OR NAVY SYMBOL	EQUIPMENT MFR. RECOMMENDATION	QTY PER SHIP GALLONS	REMARKS	SOURCE	MATERIAL RECORD	REV NO.	LINE NO.
	MAIN LUBE OIL SYSTEM	1	NNS&DD Co.	LUBE OIL SYS PIPING	LUBE OIL	SHELL TURBO 78	HVY MARINE TURB OIL RUST &	1200		PO 613C-6200-C3			1
				LUBE OIL GRAVITY TK			OXIDATION INHIBITED	4950					2
				LUBE OIL STORAGE & SETTLING TANK				18,000 GAL.	STORAGE TK - 9,000 GAL SETTLING TK - 9,000 GAL				3
			GENERAL ELECTRIC	H.P. & L.P. TURBINES				–					4
				MN RED. GEAR SUMP				2300					5
				MN THRUST BEARING				–					6
				THROTTLE CONTROL HYD POWER UNIT				–					6A
		1	GENERAL ELECTRIC	SSTG SUMP				300					7
		2	COFFIN TURBO PUMP	MN FD PUMP TURBINE SUMP				20					8
		4	TURBODYNE	C.O. PUMP SUMP				480					9
		1		BALLAST PUMP SUMP				100					10
		1		FIRE PUMP SUMP				50					11
	EMERGENCY DIESEL GENERATOR	1	WESTERN BRANCH DIESEL	DIESEL ENGINE SUMP		CAPRINUS R-40	SAE #40 HVY DTY; MAX. ZINC CONTENT 10 PPM	40	CHANGE OIL EVERY 500 HOURS				12
				GENERATOR BEARINGS				–	CHECK OIL LEVEL EVERY 300 HRS CHANGE OIL EVERY 6 MONTHS				13
	STERN TUBE LUBE OIL SYSTEM			HEAD TANK	OIL	SHELL TURBO 78	HVY MARINE TURB OIL RUST & OXIDATION INHIBITED	55		PO 613C 6200-C3			14
				DRAIN TANK				30					
				STERN TANK				400					
				PIPING				150					
				FWD SEAL SYS				7					
				STEADY BEARING				42					
	CIRCOOL MATIC ASSY						later	$6\frac{1}{2}$					15

ROUTING	CONTROL NO. SHOP	CONTROL NO. ERECTION	GROUP NO.	LIST OF LUBRICANTS	DRAWN WDB	DATE	N. N. DRAWING NO. 257331	HULL NO. 613C 614C 615C	SHEET NO. 3	REV D
					CHK EWB	DATE 3/3/8				

K+E HERCULENE® DRAFTING FILM 73187

NN23-11X17

257331

MICRO-MASTER® 105 mm
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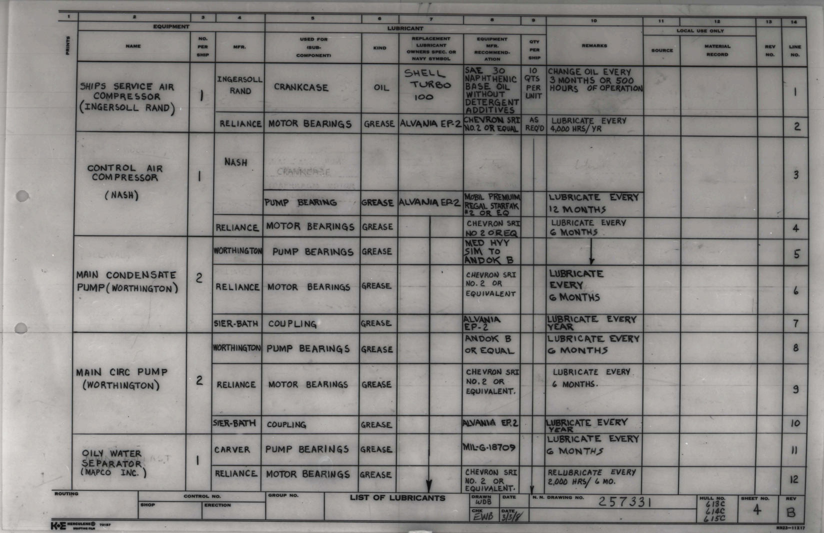

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	EQUIPMENT			LUBRICANT						LOCAL USE ONLY			
PRINTS	NAME	NO. PER SHIP	MFR.	USED FOR (SUB-COMPONENT)	KIND	REPLACEMENT LUBRICANT OWNERS SPEC. OR NAVY SYMBOL	EQUIPMENT MFR. RECOMMENDATION	QTY PER SHIP	REMARKS	SOURCE	MATERIAL RECORD	REV NO.	LINE NO.
	SHIPS SERVICE AIR COMPRESSOR (INGERSOLL RAND)	1	INGERSOLL RAND	CRANKCASE	OIL	SHELL TURBO 100	SAE 30 NAPHTHENIC BASE OIL WITHOUT DETERGENT ADDITIVES	10 QTS PER UNIT	CHANGE OIL EVERY 3 MONTHS OR 500 HOURS OF OPERATION				1
			RELIANCE	MOTOR BEARINGS	GREASE	ALVANIA EP-2	CHEVRON SRI NO.2 OR EQUAL	AS REQ'D	LUBRICATE EVERY 4,000 HRS/ YR				2
	CONTROL AIR COMPRESSOR (NASH)	1	NASH	CRANKCASE				↓					3
				PUMP BEARING	GREASE	ALVANIA EP-2	MOBIL PREMUIM REGAL STARFAK #2 OR EQ		LUBRICATE EVERY 12 MONTHS				
			RELIANCE	MOTOR BEARINGS	GREASE	↓	CHEVRON SRI NO 2 OREQ		LUBRICATE EVERY 6 MONTHS				4
	MAIN CONDENSATE PUMP (WORTHINGTON)	2	WORTHINGTON	PUMP BEARINGS	GREASE		MED HVY SIM TO ANDOK B		↓				5
			RELIANCE	MOTOR BEARINGS	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT		LUBRICATE EVERY 6 MONTHS				6
			SIER-BATH	COUPLING	GREASE		ALVANIA EP-2		LUBRICATE EVERY YEAR				7
	MAIN CIRC PUMP (WORTHINGTON)	2	WORTHINGTON	PUMP BEARINGS	GREASE		ANDOK B OR EQUAL		LUBRICATE EVERY 6 MONTHS				8
			RELIANCE	MOTOR BEARINGS	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT.		LUBRICATE EVERY 6 MONTHS.				9
			SIER-BATH	COUPLING	GREASE		ALVANIA EP.2		LUBRICATE EVERY YEAR				10
	OILY WATER SEPARATOR (MAPCO INC.)	1	CARVER	PUMP BEARINGS	GREASE		MIL-G-18709		LUBRICATE EVERY 6 MONTHS				11
			RELIANCE	MOTOR BEARINGS	GREASE	↓	CHEVRON SRI NO. 2 OR EQUIVALENT.	↓	RELUBRICATE EVERY 2,000 HRS/ 6 MO.				12

ROUTING	CONTROL NO.		GROUP NO.	LIST OF LUBRICANTS	DRAWN	DATE	N. N. DRAWING NO.	HULL NO.	SHEET NO.	REV
	SHOP	ERECTION			WDB		257331	613C 614C 615C	4	B
					CHK EWB	DATE 3/3/8				

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	AMINE INJECTION & TOXION INJECTION SYSTEMS (BULL & ROBERTS)	1 EACH	BULL & ROBERTS	SPEED REDUCER INCLUDING CRANK PIN & WRIST PIN BEARINGS PISTON		ALVANIA EP-2	MOBIL GEAR 629 OR EQUAL	AS REQ'D	CHANGE OIL 240 HRS AFTER START-UP & EVERY SIX MONTHS THEREAFTER.				1
			BIF	DIAPHRAGM PUMP BEARINGS		ALVANIA EP-2	MEROPA LUB #2 MOBIL GEAR OR EQ 629		CHANGE OIL 240 HRS AFTER START-UP EVERY 6 MONTHS AFTER THAT				3
			RELIANCE	DIAPHRAGM MOTOR BEARINGS			CHEVRON SRI NO. 2 OR EQUIVALENT						4
			LIGHTNIN	MIXING MOTOR			—		NO LUBRICATION REQD				5
	DIESEL OIL PUMP (DELAVAL)	1											6
			FALK	COUPLING	GREASE		NLGI # 2		LUBRICATE ONCE EVERY YEAR.				7
			RELIANCE	MOTOR BEARINGS	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT		LUBRICATE EVERY 6 MONTHS.				8
	FIRE PUMP (WORTHINGTON)	1	WORTHINGTON	PUMP BEARINGS	GREASE		MED HVY SIM TO ANDOK B		CHECK EVERY 6 MONTHS - REPACK IF NECESSARY				9
			SIER-BATH	COUPLING	GREASE		ALVANIA EP 2 OR EQUAL		LUBRICATE EVERY YEAR				10
			RELIANCE	MOTOR BEARINGS	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT		LUBRICATE EVERY 6 MONTHS.				11
	BILGE & BALLAST PRIMING PUMP (NASH)	1	NASH	MOTOR BEARINGS	GREASE								12
	FIRE PUMP (TURBINE DRIVEN WORTHINGTON)	1	WORTHINGTON	PUMP BEARING	GREASE		MED HVY SIM TO ANDOK B		CHECK EVERY 6 MO REPACK IF NECCESSARY				13
			SIER-BATH	COUPLING			SHELL ALVANIA EP2 OR EQ						14

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	F.W. DRAIN TRANSFER PUMP (CARVER)	2	CARVER	PUMP BEARINGS	GREASE	ALVANIA EP-2	MIL-G-18709	AS REQ'D	LUBRICATE EVERY 6 MONTHS.				1
			RELIANCE	MOTOR BEARINGS	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT		LUBRICATE EVERY 6 MONTHS.				2
	SEA WATER SERVICE PUMP (CARVER)	2	CARVER	PUMP BEARINGS	GREASE		MIL-G-18709		LUBRICATE EVERY 6 MONTHS.				3
			RELIANCE	MOTOR BEARINGS	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT		LUBRICATE EVERY 6 MONTHS.				4
	BILGE & BALLAST PUMP (CARVER)	2	CARVER	PUMP BEARINGS	GREASE		MIL-G-18709		LUBRICATE EVERY 6 MONTHS.				5
			RELIANCE	MOTOR BEARINGS	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT.		LUBRICATE EVERY 6 MONTHS.				6
	BILGE SUMP PUMPS (CARVER)	2	CARVER	PUMP BEARINGS	GREASE		MIL-G-18709		LUBRICATE EVERY 6 MONTHS.				7
			RELIANCE	MOTOR BEARINGS	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT.		LUBRICATE EVERY 2,000 HRS OR 6 MO.				8
	POTABLE WATER PUMP (CARVER)	2	CARVER	PUMP BEARINGS	GREASE		MIL-G-18709		LUBRICATE EVERY 6 MONTHS.				9
			RELIANCE	MOTOR BEARINGS	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT.		LUBRICATE EVERY 6 MONTHS.				10
	DISTILLING PLANT FEED PUMP (CARVER)	2	CARVER	PUMP BEARINGS	GREASE		MIL-G-18709		LUBRICATE EVERY 6 MONTHS.				11
			RELIANCE	MOTOR BEARINGS	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT		LUBRICATE EVERY 6 MONTHS.				12
	F.O. TRANSFER PUMP (DELAVAL)	1	FALK	COUPLING	GREASE		NLGI #2		LUBRICATE EVERY YEAR.				13
			RELIANCE	MOTOR BEARING	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT		LUBRICATE EVERY 6 MONTHS				14
	CONTAMINATED STEAM GEN FEED PUMP	3	PACIFIC	MOTOR BEARING	GREASE		↓		↓				15
	EMERGENCY SEWAGE PUMP (CARVER)	2	CARVER	PUMP BEARING	GREASE		MIL-G-18709		LUBRICATE EVERY 6 MONTHS.				16
			FALK	COUPLING	GREASE		NLGI #2		LUBRICATE EVERY YEAR				17
			RELIANCE	MOTOR BEARING	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT		LUBRICATE EVERY 6 MONTHS.				18

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	SHOP	ERECTION			CHK EWB	DATE 3-3-8		613C 614C 615C	6	B

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	L. O. PURIFIER (SHARPLES)	1	SHARPLES	PUMP BEARINGS					NO LUBE REQ'D				1
			SHARPLES	BEARING ASSEMBLY	GREASE	ALVANIA EP-2	ANDOK "C"		LUBRICATE EVERY 1000 HRS.				2
			RELIANCE	MOTOR BEARINGS	GREASE	↓	CHEVRON BRB NO.2 OR EQUIVALENT		LUBRICATE EVERY 6 MONTHS.				3
			SHARPLES	IDLER ARM	GREASE		LIGHT BALL BEARING GREASE		LUBRICATE EVERY 3 MONTHS.				4
	L.O. SERVICE PUMP (DELAVAL)	2	RELIANCE	MOTOR BEARING	GREASE		CHEVRON SRI NO. 2 OR EQ		LUBRICATE EVERY 6 MONTHS.				5
			FALK	COUPLING	GREASE		NLGI #2		LUBRICATE EVERY YEAR				6
	F. O. PUMP (DELAVAL)	2	FALK	COUPLING	GREASE		↓		↓				7
			RELIANCE	MOTOR BEARING	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT.		LUBRICATE EVERY 6 MONTHS.				8
	HOT WATER CIRC PUMP	1	RILEY-BEAIRD	PUMP BEARINGS					NO LUBRICATION REQ'D				9
													10
													11
	ELECTRIC MOTOR OPERATORS	—	QUAKER CITY	OPERATOR	OIL	OMALA 68	SHELL MACOMA OIL 33 OR EQUAL		CHECK EVERY 6 MONTHS				12
			LIMITORQUE	↓	GREASE	ALVANIA EP-2	SHELL DARINA EPO OR EQ		LUBRICATE EVERY 6 MONTHS				
	ELECTRIC MOTOR OPERATORS	20	PRE-CON	OPERATOR					NO LUBRICATION REQ'D				13

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					CHK	DATE				

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	ELECTRIC MOTOR OPERATORS	–	E.I.M.	OPERATOR	OIL	OMALA 68	SHELL MACOMA OIL 33 OR EQUAL	AS REQ'D	CHECK OIL LEVEL MONTHLY. DRAIN & REFILL WITH NEW LUBRICANT EVERY 6 MONTHS.				1
	DISTILLATE PUMP (CARVER)	2	CARVER	PUMP BEARINGS	GREASE	ALVANIA EP-2	DARINA #2	AS REQ'D	LUBRICATE EVERY 1000 HRS				2
		2	RELIANCE	MOTOR BEARINGS			–	–	NO LUBRICATION REQ'D.				3
	BRINE PUMP (CARVER) (FOR SEA WATER COOLED DISTILLING PLANT)	1	CARVER	PUMP BEARINGS	GREASE	ALVANIA EP-2	DARINA #2	AS REQ'D	LUBRICATE EVERY 1000 HRS				4
		1	RELIANCE	MOTOR BEARINGS	GREASE	↓	CHEVRON SRI #2 OR EQ	↓	LUBRICATE EVERY 3 MONTHS				5
	AUXILIARY DIESEL GENERATOR	1	ELECTRO-MOTIVE	DIESEL ENGINE SUMP	LUBE OIL	CAPRINUS R-40	SAE# 40 HEAVY DUTY; MAX ZINC CONTENT 10 PPM.	152 GAL.	CHANGE OIL EVERY 4000 HRS.				6
				GENERATOR BEARING	GREASE	ALVANIA EP-2	EXXON UNIREX N#2 OR CHEVRON SRI #2.	AS REQ'D	GREASE ADDED ONCE EVERY 90 DAYS.				7
	AUXILIARY CONDENSATE PUMP (WORTHINGTON)	1*	WORTHINGTON	PUMP BEARINGS	GREASE	↓	CHEVRON O.H.T OR EQ	↓	CHECK EVERY 6 MO REPACK IF NECESSARY				8
		2Δ	RELIANCE	MOTOR BEARINGS	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT		LUB. EVERY 3 MO. Δ LUB. EVERY 6 MO. *				9
			SIER-BATH	COUPLING	GREASE		SHELL ALVANIA EP 2 OR EQUAL		CHECK EVERY 6 MO REPACK IF NECESSARY				10
	BRINE + DISTILLATE PUMP + PUMP (FOR CONDENSATE COOLED DISTILLING PLANT)	1	CARVER	PUMP BEARINGS	GREASE		DARINA #2	AS REQ'D	LUBRICATE EVERY 1000 HRS				11
	* FOR 615C ONLY Δ FOR 613C & 614C ONLY	1	RELIANCE	MOTOR BEARINGS					NO LUBRICATION REQ'D.				12

ROUTING	CONTROL NO. SHOP ERECTION	GROUP NO.	LIST OF LUBRICANTS	DRAWN WDB CHK EWB	DATE DATE 3-3-8	N. N. DRAWING NO. 257331	HULL NO. 613C 614C 615C	SHEET NO. 8	REV B

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	CARGO & BALLAST VALVE HYDRAULIC POWER PACK (MARINE HYDRAULIC SYSTEMS INC	2	MARINE HYDRAULIC SYS. INC	POWER PACK	HYD. FLUID	SHELL TELLUS 32	SHELL TELLUS 32	AS REQ				C	1
		2	FALK	COUPLING	GREASE	ALVANIA EP-2	NLG I GREASE #2	AS REQD	LUBRICATE EVERY YEAR				1-A
		2	RELIANCE	MOTOR	GREASE	↓	ALVANIA GREASE #2	↓	↓				1-B
	ENGINEER'S ELEVATOR	1	UNIDYNAMICS	MACHINERY PACKAGE GEARBOX	GEAR OIL	OMALA 220	AGMA 5 COMPOUNDED OIL, CHEVRON OC TURBINE OIL 36 OR EQUAL	2 GAL.	LUBRICATE AS REQUIRED				2
				ELECTRIC MOTOR COUPLING & GEARBOX PRESSURE FITTINGS	GREASE	ALVANIA EP-2	CHEVRON DURA-LITH EPI OR EQUAL	1 LB	↓				3
				PRESSURE GREASE FITTINGS PILLOW BLOCKS ON MACHY PACKAGE.	GREASE	↓	MIL-G-10924 (CHEVRON DURA-LITH EPI OR EQUAL.	1 LB	↓				4
				PARTS REQUIRING LUBRICATION BY OIL CAN	OIL	SHELL TURBO 100	SAE 30 ENG OIL NON-DETERGENT	2 QT.	↓				5
				PRESSURE GREASE FITTINGS FOR ELECTRIC MOTOR	GREASE	ALVANIA EP-2	GE D6A2C5	AS REQ'D	↓				6
				WIRE ROPES	ROPE LUBE	OMALA H	LUBE-TECT 250 OR EQUAL.	10 LB	NYLUBE PRODUCTS, INC. FRANCIS PALMS BLDG. 2111 WOODWARD DETROIT, MICH 48201				7
				GUIDE RAILS	RAIL LUBE	↓	NYLUBE 150 OR EQUAL	10 LB					8
	OIL CONTENT SAMPLING PUMP (BULL & ROBERTS)	3 Δ 1 *	ECO	PUMP BEARINGS	GREASE	ALVANIA EP-2	CHEVRON SRI NO. 2 OR EQUAL	AS REQD					9
		3 Δ 1 *	GE	MOTOR BEARINGS	GREASE	↓	↓	↓					10
	* FOR 615C ONLY. Δ FOR 613C & 614C ONLY												11

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	STEERING GEAR	1	WESTERN GEAR CO.	HELIX SCREW, CROSSHEAD BLOCK	GREASE	ALVANIA EP-2	SHELL ALVANIA EP2 OR EQUAL	AS REQ'D	LUBRICATE EVERY 100 HRS.				1
				EMERGENCY PUMP	GREASE	↓	SHELL ALVANIA EP2 OR EQUAL	↓	LUBRICATE BEFORE USE.				2
				FOLLOW UP	GREASE	AERO SHELL GREASE 22	AERO SHELL #22 OR EQUAL	↓	LUBRICATE YEARLY				3
				POWER UNIT SERVICE TANK	OIL	SHELL TURBO 68	SHELL TURBO 33 OR EQUAL	↓	MAINTAIN LEVEL CHANGE ANNUALLY.				4
				STROKE CONTROL LINKAGE	OIL	↓	SHELL TURBO 33 OR EQUAL	↓	LUBRICATE EVERY 100 HRS.				5
				POWER UNIT COUPLING	GREASE	ALVANIA EP-2	SHELL ALVANIA EP2 OR EQUAL	↓	CLEAN & REPACK ANNUALLY				6
		4	RELIANCE	ELECTRIC MOTOR	GREASE	↓	CHEVRON SRI #2 OR EQUAL	↓	LUBRICATE EVERY 6 MONTHS.				7
	WINDLASS	2	LEBUS INTERNATIONAL INC.	GEAR CASING	GEAR OIL	OMALA 150	SHELL OMALA 69 OR EQUAL	↓	LUBRICATE ANNUALLY				8
				PRESSURE GREASE FITTINGS AND SURFACES REQUIRING LUBRICATION BY BRUSH OR SWAB	GREASE	ALVANIA EP-2	CHEVRON SRI GREASE NO. 2 OR EQUAL.	↓	LUBRICATE MONTHLY				9
	FIRST LINE ASHORE WINCH WITH POWERED ROPE REEL, FLEET ANGLE ELIMINATOR & TWO DIRECTION CHANGING SHEAVES	△ 2	LEBUS INTERNATIONAL INC.	TRACTION UNIT GEAR CASE	GEAR OIL	OMALA 150	SHELL OMALA 69 OR EQUAL	↓	QTY LISTED IS FOR INFO ONLY. THE WINCHES ARE SHIPPED FULL OF GEAR OIL.				10
				PRESSURE GREASE FITTINGS	GREASE	ALVANIA EP-2	CHEVRON SRI GREASE NO. 2 OR EQUAL	↓	LUBRICATE MONTHLY				11
				GEAR BOX FOR ROPE REEL	GEAR OIL	OMALA 150	SHELL OMALA 69 OR EQUAL	↓	QTY LISTED IS FOR INFO ONLY. THE ROPE REELS ARE SHIPPED FULL OF GEAR OIL.				12
				CHAIN & SPROCKETS ON ROPE REEL	GREASE	ALVANIA EP-2	TEXACO WATER COMPOUND 00 OR EQUAL	↓	BRUSH ON EVERY 10 HOURS OF OPR. OR MONTHLY				13
	△ FOR 613C & 614C ONLY			SURFACES REQUIRING LUBRICATION BY BRUSH OR SWAB	GREASE	↓	CHEVRON SRI GREASE NO. 2 OR EQUAL	↓	↓				14

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	MOORING WINCHES	9△ 10*	LEBUS INTERNATIONAL INC.	GEAR BOX	OIL	OMALA 150	SHELL OMALA 69 OR EQUAL SAE 90	1800 GAL△ 2000 GAL*	CHANGE ANNUALLY				1
				GREASE FITTINGS 19 FITTINGS/UNIT	GREASE	ALVANIA EP-2	CHEVRON SR1#2 OR EQUAL	–	GREASE MONTHLY				
				BRAKE SHAFT TREADS	↓	↓	↓	–	BRUSH ON GREASE MONTHLY				
	RUDDER STOCK BEARER	1		STOCK SLEEVE, LIP OF SEAL, SPRING GROOVE.	GREASE	↓	LUBRIPLATE OR EQUAL						2
	RUDDER BEARING FRICTION RING	1			OIL	SHELL TURBO 150	MOBIL GRADE BB OR EQUAL						3
	MOORING FITTINGS	20		ROLLER BEARINGS	GREASE	ALVANIA EP-2	AMOCO RYKON GR 0,1,&2		LUBRICATE MONTHLY				4
	VAC-STRIP SYSTEM (WORTHINGTON)	5	WORTHINGTON	PUMP BEARINGS	OIL	OMALA 68	SAE 20 MINERAL OIL		FILL CUPS AS REQUIRED				5
			RELIANCE	MOTOR BEARINGS	GREASE	ALVANIA EP 20	CHEVRON SR 12 OR EQUAL		LUBRICATE EVERY 4 MONTHS				
	* FOR 615C ONLY △ FOR 613C & 614C ONLY		AMERIGEAR	FLEX COUPLING	GREASE	ALVANIA EP 1 OR 2	ALVANIA EP 1 OR 2 OR EQUAL		LUBRICATE EVERY YEAR				

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1	2	3	4	5	6	7	8	9	10	11	12	13	14
	EQUIPMENT			LUBRICANT						LOCAL USE ONLY			
PRINTS	NAME	NO. PER SHIP	MFR.	USED FOR (SUB-COMPONENT)	KIND	REPLACEMENT LUBRICANT OWNERS SPEC. OR NAVY SYMBOL	EQUIPMENT MFR. RECOMMEND-ATION	QTY PER SHIP	REMARKS	SOURCE	MATERIAL RECORD	REV NO.	LINE NO.
	DIESEL GEN. S.W. PUMP (WORTHINGTON)	1	WORTHINGTON	PUMP BEARING	GREASE	ALVANIA EP-2	MED HVY SIM TO ANDOK B	AS REQ'D	CHECK EVERY 6 MONTHS				1
			FALK	COUPLING	GREASE		NLGI #2		LUBRICATE ONCE A YEAR				2
			RELIANCE	MOTOR BEARINGS	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT		LUBRICATE EVERY 6 MONTHS.				3
	S.W. SCRUBBER PUMP (CARVER)	2	CARVER	PUMP BEARING	GREASE		MIL-G-18709		LUBRICATE EVERY 6 MONTHS.				4
			RELIANCE	MOTOR BEARING	GREASE		CHEVRON SRI NO. 2		LUBRICATE EVERY 6 MONTHS.				5
	SLOP TANK DRAIN PUMP (WORTHINGTON)	2*	WORTHINGTON	PUMP BEARING	GREASE								6
			RELIANCE	MOTOR BEARING	GREASE		CHEVRON SRI NO. 2 OR EQUIVALENT.		LUBRICATE EVERY 6 MONTHS.				7
	HARBOR FEED PUMP (UNION PUMP CO.)	1	UNION PUMP CO.	CRANKCASE	OIL	OMALA 68	CHEVRON GEAR COMPOUND 70 OR EQUAL	10 GAL.	CHANGE OIL EVERY 6 MONTHS OR 2500 HRS OF OPERATION.				8
			FALK	COUPLING	GREASE	ALVANIA EP-2	NLGI NO. 2	AS REQ'D	CHECK ONCE A YEAR.				9
			RELIANCE	MOTOR BEARING	GREASE		CHEVRON SRI №2		LUBRICATE EVERY 6 MONTHS				10
	SEWAGE HOLDING DIFFUSER BLOWER	1	RELIANCE	MOTOR BEARING	GREASE		CHEVRON SRI №2		LUBRICATE EVERY 6 MONTHS				11
	SEWAGE TREATMENT PLANT	1	AURORA PUMPS	PUMP BEARINGS	GREASE		CHEVRON SRI №2		LUBRICATE EVERY 2000 HRS.				12
			RELIANCE	MOTOR BEARINGS	GREASE				LUBRICATE EVERY 6 MONTHS				13
			AMF CUNO	PUMP	OIL	MOBIL VELOCITE NO. 10	SHELL TELLUS 21	1QT	CHANGE OIL EVERY 6 MONTHS OR 2000 HRS OF OPERATION				14
			ROOTS	BLOWER GEAR CHAMBER	OIL	SHELL TURBO 100	SAE 40 ENG OIL NON-DET	1QT	CHANGE OIL EVERY 2000 HRS OF OPERATION				15
				SHAFT BEARINGS	GREASE	ALVANIA EP-2	NGLI #2	AS REQ'D	LUBRICATE AS REQ'D				16
			GORMAN-RUPP	PUMP BEARINGS	OIL	SHELL TURBO 100	SAE 40 OIL	AS REQ'D	CHANGE OIL YEARLY				17
				STUFFING BOX SEAL	OIL				CHANGE OIL EVERY 2 OR 3 MONTHS				18

ROUTING	CONTROL NO.	GROUP NO.		DRAWN	DATE	N. N. DRAWING NO.	HULL NO.	SHEET NO.	REV
* G15C ONLY △ G13C & G14C	SHOP ERECTION		LIST OF LUBRICANTS	WDB CHK EWB	DATE 3-3-8	257331	613C 614C 615C	12	B

MN23-11X17

K+E HERCULENE® 73187 DRAFTING FILM

257331

SEPT. '80

4X

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	EQUIPMENT			LUBRICANT						LOCAL USE ONLY			
PRINTS	NAME	NO. PER SHIP	MFR.	USED FOR (SUB-COMPONENT)	KIND	REPLACEMENT LUBRICANT OWNERS SPEC. OR NAVY SYMBOL	EQUIPMENT MFR. RECOMMENDATION	QTY PER SHIP	REMARKS	SOURCE	MATERIAL RECORD	REV NO.	LINE NO.
	AIR PREHEATER (LJUNGSTROM)	2		ROTOR SUPPORT BEARING	OIL	OMALA 68	EP TYPE LUBRICANT WITH LEAD NAPHTHENATE ADDITIVE OR MINERAL OIL.	6½ GAL.					1
		2		ROTOR GUIDE BEARINGS	OIL	↓	EP TYPE LUBRICANT WITH LEAD NAPHTHENATE ADDITIVE OR MINERAL OIL.						2
		4	MASTER	DRIVE MOTOR BEARINGS	GREASE	ALVANIA EP-2	ASTM 270-290		LUBRICATE EVERY 6 MONTHS.				3
		4	RELIANCE	AUXILIARY DRIVE MOTOR BEARINGS	GREASE	↓	ASTM 270-290		LUBRICATE EVERY 6 MONTHS.				4
		2	FALK	SPEED REDUCER	OIL	OMALA 150	MINERAL OIL SAE 40.	3½ GAL	DRAIN & FLUSH ONCE A YEAR.				5
		4		LOW SPEED SHAFT BEARING (UPPER & LOWER)	GREASE	ALVANIA EP-2	NO. 2 BALL & ROLLER BEARING GREASE.		LUBRICATE ONCE A YEAR.				6
	INERT GAS PLANT (PEABODY)	2	CAMAR	INERT GAS BLOWERS BEARINGS	↓	↓	ALVANIA EP-2						7
		2	RELIANCE	MOTOR BEARINGS	GREASE	ALVANIA EP-2	CHEVRON SRI #2 OR EQUAL		LUBRICATE EVERY 6 MONTHS OR AS REQ'D.				8
		2		COUPLING	GREASE	↓	PHILLIPS PETRO TYPE 9395 PHILUBE E.P.		LUBRICATE EVERY 6 MONTHS OR AS REQ'D.				9
		1	N.N.S.	PRESS/VAC BREAKER	OIL	TELLUS 32	SAE 10W OIL						10
	FORCED DRAFT BLOWER			FAN	GREASE	ALVANIA EP-2	SHELL EP-2						11
			RELIANCE	MOTOR	GREASE	↓	CHEVRON BRB #2						12
	SOOT BLOWERS		COMBUSTION ENGINEERING	AIR LINE LUBRICATORS	OIL	TELLUS 32	TELLUS 27						13
				GEARCASE-CARRIAGE	OIL-10W-40	OMALA 68	OMALA 33						14
				GEAR RACK	GREASE	ALVANIA EP-2	CHEVRON MS-CB OR EQ						15
				BLOWERS	↓	↓	ALVANIA EP 1						16
				LANCE HUB BRGS	↓	↓	DARINA EP-1						17

ROUTING	CONTROL NO. SHOP	CONTROL NO. ERECTION	GROUP NO.	LIST OF LUBRICANTS	DRAWN WDB CHK EWB	DATE DATE 3-3-8	N.N. DRAWING NO. 257331	HULL NO. 613C 614C 615C	SHEET NO. 13	REV B

K+E HERCULENE® DRAFTING FILM 73197

NN23—11X17

257331

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA • ALEXANDRIA • RICHMOND • NORFOLK

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4X

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	EQUIPMENT			LUBRICANT						LOCAL USE ONLY			
PRINTS	NAME	NO. PER SHIP	MFR.	USED FOR (SUB-COMPONENT)	KIND	REPLACEMENT LUBRICANT OWNERS SPEC. OR NAVY SYMBOL	EQUIPMENT MFR. RECOMMENDATION	QTY PER SHIP	REMARKS	SOURCE	MATERIAL RECORD	REV NO.	LINE NO.
	AIR CONDITIONING REFRIGERATION PLANT	2	CARRIER CORP.	CRANKCASE	OIL	NO SHELL PRODUCT	CARRIER PP36-1 OR SUNISO 4G OR 3GS.	41 PINTS	P.O. 2670-C1 REFER TO TECHNICAL MANUAL				1
		2	RELIANCE	MOTOR BEARINGS	GREASE	ALVANIA EP-2	CHEVRON SRI NO. 2 OR EQUAL		P.O. 2670-C1 LUBRICATE EVERY 6 MONTHS.				2
	SHIPS STORES REFRIGERATION PLANT	2	CARRIER CORP.	CRANKCASE	OIL	NO SHELL PRODUCT	CARRIER PP36-1 OR SUNISO 4G OR 3GS.	12 PINTS	REFER TO TECHNICAL MANUAL P.O. 2670-C1				3
		2	RELIANCE	MOTOR BEARING	GREASE	ALVANIA EP-2	CHEVRON SRI NO.2 OR EQUIVALENT		LUBRICATE EVERY YEAR.				4
	E.R. CONTROL ROOM AIR CONDITIONING UNIT- SYS 28&29	2	CARRIER CORP.	FAN MOTOR BEARING	OIL	TELLUS 32	SAE 10 W		NO LUBRICATION 1st 5 YEARS. CLEAN & RE-OIL ANNUALLY THEREAFTER. P.O. 2670-C2 REFER TO TECHNICAL MANUAL				5
	GALLEY A/C UNIT WITH FAN- SYS (27)	1	CARRIER CORP	FAN SHAFT BEARINGS	—	—	—		LUBRICATED FOR BRNG LIFE				6
				FAN SHAFT STUFF. BOX	GREASE	—	SHELL ALVANIA #2		LUBRICATE EVERY 6 MO.				7
				FAN MOTOR BEARING	OIL	—	SAE 10W		BY HOPEMAN BROTHERS: FAN MOTOR BRNGS ARE FACTORY LUBRICATED FOR FIRST 5 YRS. (3 YRS AT CONTINUOUS SERVICE OR EXCESSIVELY DIRTY CONDITIONS) INSPECT BRNGS & RELUBRICATE OR REPLACE AS REQ'D.				8
	GLAND LEAK-OFF EXHAUSTER	1	BUFFALO FORGE CO.	MOTOR BEARING RELIANCE ELECT CO.	GREASE	ALVANIA EP-2	CHEVRON SRI NO. 2 OR EQUIVALENT		LUBRICATE EVERY 6 MONTHS				9
	E.R. AXIAL FLOW VENT FANS - SYS 1 THRU 7.	7	JOY MFG. CO.	MOTOR BEARINGS - RELIANCE ELEC. CO.	GREASE	↓	PRELUBRICATED SEALED BALL BEARING	—	P.O. 2685-C3				10
		2	NNS	STUFFING BOX	GREASE		SHELL ALVANIA #3		LUB. EVERY 1500 HRS OR 3 MO.				11
	PUMP RM. CENTRIFUGAL FANS - SYS E8 & E9.	4	BUFFALO FORGE CO.	FAN SHAFT BEARINGS	GREASE		SHELL ALVANIA #3 (LITHIUM GREASE BASE)		LUBRICATE BEARINGS EVERY 1500 HRS OR 3 MO				12
		4		MOTOR BEARINGS - RELIANCE ELEC. CO.	GREASE		CHEVRON SRI NO. 2 OR EQUAL		RELUBRICATE BRNGS EVERY 1500 HRS OR 3 MO. WITH 2 CU. IN OF GREASE				13
	A/C CENTRIFUGAL FANS - SYS 10-11	2	SIER-BATH	FLEXIBLE COUPLING	GREASE		SHELL ALVANIA EP-2 OR EQUAL		LUB. EVERY 1500 HRS OR 3 MO.				14
		2	BUFFALO FORGE CO.	MOTOR BRNG RELIANCE ELECT CO.	GREASE		CHEVRON SRI NO.2 OR EQUAL		LUB. EVERY 6 MO.				15
				FAN SHAFT BEARINGS	GREASE		SHELL ALVANIA #3		LUB. EVERY 6 MO.				16
	CENTRIFUGAL EXHAUST FAN SYSTEM - SYS 12	1	BUFFALO FORGE CO.	MOTOR BRNGS RELIANCE ELECT CO.	GREASE		CHEVRON SRI NO.2 OR EQUAL		P.O. BY HOPEMAN BROS.				17

ROUTING	CONTROL NO.		GROUP NO.	LIST OF LUBRICANTS	DRAWN	DATE	N. N. DRAWING NO.	HULL NO.	SHEET NO.	REV
	SHOP	ERECTION			WDB		257331	613C 614C 615C	14	B
					CHK EWB	DATE 3-3-8				

K+E HERCULENE® DRAFTING FILM 73167

MN23—11X17

257331

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4X

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	EQUIPMENT			LUBRICANT						LOCAL USE ONLY			
PRINTS	NAME	NO. PER SHIP	MFR.	USED FOR (SUB-COMPONENT)	KIND	REPLACEMENT LUBRICANT OWNERS SPEC. OR NAVY SYMBOL	EQUIPMENT MFR. RECOMMENDATION	QTY PER SHIP	REMARKS	SOURCE	MATERIAL RECORD	REV NO.	LINE NO.
	AXIAL FAN EXHAUST - SYS 13	1	BUFFALO FORGE CO.	MOTOR BRNGS RELIANCE ELECT CO.	GREASE	—	PRELUBRICATED SEALED BALL BEARINGS		P.O. BY HOPEMAN BROS.				1
	AXIAL FAN SUPPLY - SYS 14	1	BUFFALO FORGE CO.	MOTOR BEARINGS RELIANCE ELECT CO.	GREASE	—	PRELUBRICATED SEALED BALL BEARINGS		P.O. BY HOPEMAN BROS.				2
	AXIAL FLOW VENT FAN SYS 15 THRU 20 & 26	7	BUFFALO FORGE CO.	MOTOR BEARINGS-RELIANCE ELEC. CO.	GREASE	—	PRELUBRICATED SEALED BALL BEARINGS	—	P.O. 2685 - C7				3
	CENTRIFUGAL VENT FAN SYS 21-24	4	BUFFALO FORGE CO.	MOTOR BEARINGS-RELIANCE ELEC. CO.	GREASE	ALVANIA-EP-2	CHEVRON SRI NO. 2 OR EQUIVALENT		RELUBRICATE EVERY 6 MONTHS. (2000 HRS) P.O. 2685-C7				4
	STEAM UNIT HEATER NO. 1	1	BUFFALO FORGE CO.	MOTOR BEARINGS-RELIANCE ELECT CO.	GREASE	↓	CHEVRON SRI NO. 2 OR EQUAL		RELUBRICATE EVERY 6 MONTHS 2000 HRS P02652-C6				5
	CENTRIFUGAL EXH FAN - SYS 30	1	BUFFALO FORGE CO.	MOTOR BEARINGS-RELIANCE CO.	GREASE	ALVANIA-EP-2	CHEVRON SRI NO. 2 OR EQUAL		P.O. BY HOPEMAN BROS. LUB. EVERY 6 MO.				6
	VENTILATION & A.C. DUST FILTERS	—	CONTINENTIAL AIR FILTER CO	FILTER CELLS	OIL	SHELL TURBO 78	CONTINENTAL OIL C-5 FILTER OIL	AS REQ'D	P.O. BY HOPEMAN BROS.				7
	WT SLIDING DOOR	1.	WALZ & KRENZER	DOOR SEALING SURFACE	GREASE	OMALA H	LIGHT GRADE		BRUSH ON THIN FILM EVERY TWO WEEKS				8
				DOOR ROLLERS/PINS	↓	↓	GOOD GRADE		LUBRICATE EVERY TWO WEEKS				9

* FOR 615C ONLY.
△ FOR 613C & 614C ONLY

ROUTING	CONTROL NO.		GROUP NO.		DRAWN	DATE	N. N. DRAWING NO.	HULL NO.	SHEET NO.	REV
	SHOP	ERECTION		LIST OF LUBRICANTS	WDB		257331	613C 614C 615C	15	B
					CHK EWB	DATE 3-3-8				

K+E HERCULENE® 73187 DRAFTING FILM

NN23—11X17

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257332

CSD VAULT Q

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APP'D.
		SEE SH #2				

REV. STATUS OF SHEETS								
REV.	F	F	F	F	F	B	F	F
SHEET	1	2	3	4	5	2A	6	7

GROUP

MC NO.

V1269

DWG. REV. —HULL APPLIC.

REV.	NN HULLS ONLY 613	614	615
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	NO
E	YES	YES	NO
F	YES	YES	NO

NNS & DD Co. HULL NO.	MARAD HULL NO.	USMA DESIGN	SHIP'S NAME
615C 614C 613C			

APPROVALS

OWNERS	ABS NR
	USCG NR

Newport News Shipbuilding
A Tenneco Company
TENNECO
Commercial Ship Division
FSCM NO. 43689
— DESIGN DIVISION DEPT. —

SCALE: NONE = 1 Ft.	DATE COMPL. 11-10-76
DRAWN: JHJ	EXAMINED:
CHECKED:	AUTHORIZED: E E Stephenson
SECT. MGR. J H Johnson	DATE 11-10-76
TECH. APPROVAL NR	CSD APPROVAL EED for R.L. HARRINGTON

TITLE

LIST OF RELIEF VALVES

(5)

DWG. NO. 257332 REVISION F SHEET NO. 1 OF 7

M7 11 X 17

DATES — GROUPED: BY, CHK. — COMP. — PART

HULL — GROUP NO. — KEY

TYPE OF DWG. —

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 2-21-9 SIGNED J H Johnson

SPECIAL PRINTS

REV.	DATE ISSUED
A	11-15-76
B	2-23-77
C	6-15-78
D	8-31-78
E	10-12-78
F	2-27-79

YARD PRINTS

FIRST ISSUE	DEPT.	NO. PRINTS
	AH	
	BL	
	BR	
	EL	
	FP	
11-15-76	MI	2
	ML	
	MS	
	PC	
	PM	
11-15-76	PS	6
	PN	
	RD	
	RM	
	MIR	
	SH	
	SM	
	TM	
	WD	
	WE	
	WM	
	X16	

ORDERED BY DESIGN

FIRST ISSUE	DEPT.	NO. PRINTS
11-15-76	SEPIA/RD	1
	CSD-V	1
	JHJ	1
	K50	1
8-31-78	OR/SHELL	2

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REVISIONS

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		[redacted]	
NN	[redacted]					DATE	AUTHD	DATE	APPD
—	-	A	—	-	INITIAL ISSUE	11/10/6	JHJ	—	-
—	—	B	2A		ADDED SH # 2A	7/19/7	JHJ*	—	—
			3		INFORMATION ALTERED FOR ITEMS 1 THRU 29. DELETED V563.				
			4		INFORMATION ALTERED FOR ITEMS 30 THRU 58.				
			5		INFORMATION ALTERED FOR ITEMS 59 THRU 75. ADDED ITEMS 76 THRU 87.				
			6		ADDED SH. #6 ADDED ITEMS 88 THRU 110. WDB				
—	—	C	6	6 3	ADDED ITEM 111 V144 WAS SET AT 168 GER	6/5/8	JHJ	—	-
—	—	D	6		ADDED ITEM 112 & 113 & 114 LAM	8/24/8	JHJ	—	—
			3	9	INFO ADDED IN REMARKS COLUMN				
			6		ADDED ITEM 115. ERS				
		E	3	-	ALT'D LINE 22, 23, 24 & 25 SET PRESS WAS 110 PSIG	10/9/8	JHJ	—	—
			4	-	ALT'D LINE 37, 38, 39 & 40 SET PRESS WAS 110 PSIG.				
			6		ADDED ITEM 116. LAM				
—	—	F	6	-	ALT'D ITEM NO. 108, END CONN, IN & OUT WAS S.W. ADDED S/M.	2/21/9	JHJ	—	-
			2A 4 7		ADDED REF. 16, 17, + 18. ALTERED PRESS. SETTING ITEM 53, 54, + 58. ADDED ITEMS 88-95. ERS				
			5		ITEM NO'S 59 & 60; LINE 16 WAS 30 PSIG. ACCOMP. ON 613C BY LIAISON NO. 613C-JHJ-66.)				
			7		ITEM 89; ALT'D SET PRESS, WAS 127 PSIG. WORK ACCOMP. ON LR 613C-JHJ-216.				

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		[redacted]	
NN	[redacted]					DATE	AUTHD	DATE	APPD

HULL NO.	DWG. NO.	REV. F
613C, 614C, 615C	257332	SHEET 2

K&E 19 1253 3-75 3033A•

NN11-11 X 17 (REV. 1)

257332

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TABLE OF CONTENTS

SH NO.	TITLE
1	TITLE SHEET
2	REVISIONS
3	TABLE OF CONTENTS
4-7	VALVE LIST

REFERENCES

NO.	TITLE	DWG NO.
1	DIAG BILGE & BALLAST SYSTEM - LIST	2280-692
2	DIAG POTABLE WATER SYSTEM - LIST	2350-1343
3	DIAG FIREMAIN SYSTEM - LIST	2400-960
4	DIAG MAIN LUBE OIL - LIST	6200-610
5	DIAG MAIN STEAM SYSTEM - LIST	6440-506
6	DIAG AUX STEAM SYSTEM - LIST	6450-684
7	DIAG CONTAM. STM GEN SYSTEM - LIST	6450-693
8	DIAG GLAND SEAL LEAK-OFF & TURBINE DRAIN PIPE - LIST	6450-699
9	DIAG AUX EXH BLEED STM & RED. VLV ESCAPE - LIST	6451-472
10	DIAG COMPRESSED AIR SYSTEM - LIST	6454-536
11	DIAG BLR FEED WATER SYSTEM - LIST	6552-373
12	DIAG CNDS RES & MAKE-UP FEED SYSTEM - LIST	6552-381
13	DIAG DRAIN COLLECTING SYSTEM - LIST	6555-465
14	DIAG DISTILLING PLANT SYSTEM - LIST	6557-89
15	DIAG F.D. & D.O. SERV. FILL & TRANS SYSTEM - LIST	6950-99
Ⓕ 16	DIAG PLUMBING, SOIL DRAINS + VENTS - ARR	2500-2259
17	DIAG POTABLE WATER SYS - ARR	2350-1342
18	DIAG FIREMAIN SYSTEM - ARR	2400-959

HULL NO. 613C, 614C, 615C
DWG. NO. 257332
REV. F
SHEET 2A

K&E 19 1253 10-71 2236•

NH12-11 X 17 (REV. 1)

257332

MICRO-MASTER 105 mm

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
PRINTS	ITEM NO.	NO PER SHIP	SERVICE	VALVE NO	TYPE	MATERIAL		END CONNECTION				CAPACITY (CONTR. CALC)	MANUFACTURER GUARANTEE		SET PRESS	BACK PRESS.	HYDRO TEST	MANUFACTURER REFERENCE		~~BU SHIPS SED~~ REMARKS			LOCATION		SOURCE OF MATL	GROUP NO.	REV NO.
								INLET		OUTLET																	
						TRIM	BODY	SIZE	TYPE	SIZE	TYPE		CAPACITY	MAX. OVER-PRESS.				VALVE DESIGN	REPAIR PARTS	~~TYPE~~	~~CLASS~~	~~SPEC.~~	ARRGT. DWG.	PIPE OR EQUIP.			
	1	1	AUX. STM. TO CONTAM ST. GEN & 5TH STG. FD. HTR	V76	RELIEF	SS	STL	2½	600# FLG	4"	150# FLG	52,000 #/HR	53,374 #/HR	—	400 PSIG	10 PSIG	—	KUNKLE 8221	—	H 615C ONLY			6450 -683	ON PIPE	6450-C7 ②		B
	2	1	↓	V76	↓	↓	↓	4	↓	6	↓	86,000 #/HR	—	—	↓	↓	—	KUNKLE 8258	—	H613C & H614C ONLY			↓	↓	(2A)		B
	3	1	AUX. STM. AUG. TO CONTAM STM SYS	V77	↓	↓	↓	3	300# FLG	4	↓	28000 #/HR	29786 # HR	—	150 PSIG	↓	—	KUNKLE 8222	—	H615 ONLY			↓	↓	③		B
	4	1	↓	V77	↓	↓	↓	6	↓	8	↓	89000 #/HR	—	—	242 PSIG	↓	—	KUNKLE	—	H613C & H614C ONLY			↓	↓	(3A)		B
	5	1	AUX STM. TO AIR EJECTORS	V78	↓	↓	↓	2	↓	3	↓	10000 #/HR	11821 #/HR	—	168 PSIG	↓	—	KUNKLE 8223	—				↓	↓	④		B
	6	1	AUX STM. TO BLR. ATOMIZING	V79	↓	↓	↓	1¼	↓	2	↓	2900 #/HR	3989 #/HR	—	168 PSIG	↓	—	KUNKLE 8220	—				↓	↓	⑤		B
	7	1	AUX STM TO 4TH STG FD HTR	V81	↓	↓	↓	2½	↓	4	↓	28000 #/HR	28194 #/HR	—	230 PSIG	↓	—	KUNKLE 8224	—				↓	↓	⑥		B
	8	1	AUX STM TO SLOP TK HTG COIL	V126	↓	↓	↓	2½	↓	4	↓	25000 #/HR	—	—	168 PSIG	↓	—	KUNKLE 8251	—	H615C ONLY			↓	↓	⑦		B
	9	1	AUX STM TO TK CLN HTR	V144	↓	↓	↓	6	↓	10	↓	158000 #/HR	—	—	110 PSIG	20 PSIG	—	KUNKLE 8259	—	SPRING REPLACED ON M.O. 257338-3 SH-11 L-1			↓	↓	⑧		D
	10	1	AUX STM TO STRIP PUMP & DK MACHY	V149	↓	↓	↓	4	↓	6	↓	90000 #/HR	88,718 #/HR	—	245 PSIG	↓	—	KUNKLE 8226	—	H615C ONLY			↓	↓	⑨		B
	11	1	AUX STM TO STRIPPING PUMP	V149	↓	↓	↓	2	↓	3	↓	24000 #/HR	—	—	245 PSIG	↓	—	KUNKLE 8257	—	H613C & H614C ONLY			↓	↓	(9A)		B
	12	1	FWD. DK. MACHY EXHAUST	V225	SENTINEL	BRZ	BRZ	½	SCRD	½	SCRD	—	—	—	50 PSIG	—	—	KUNKLE 8208	—	H615C ONLY				↓	⑩		B
	13	1	↓	V514	↓	↓	↓	↓	↓	↓	↓	—	—	—	↓	—	—	↓	—	H613C & H614C ONLY			6450 -692	↓	⑩		B
	14	1	AFT DK MACHY EXHAUST	V226	↓	↓	↓	↓	↓	↓	↓	—	—	—	↓	—	—	↓		H615C ONLY				↓	⑪		B
	15	1	↓	V515	↓	↓	↓	↓	↓	↓	↓	—	—	—	↓	—	—	↓		H613C & H614C ONLY			6450 -692	↓	⑪		B
	16	1	EXH FROM STRIP PUMP	V227	↓	↓	↓	↓	↓	↓	↓	—	—	—	↓	—	—	KUNKLE 8208					6451 -471	↓	⑫		B
	17	1	EXH TO DIST PLANT	V228	RELIEF	BRZ	C.I.	4	250 FLG	4	125 FLG	8500 #/HR	—	—	10 PSIG	0	—	KUNKLE 8201					↓	↓	⑬		B
	18	1	↓	V229	↓	↓	↓	↓	↓	↓	↓	↓	—	—	↓	0	—	↓					↓	↓	⑬		B
	19	1	EXHAUST MAIN	V230	↓	SST	STL	6	150 FLG	8	150 FLG	60000 #/HR	72308 #/HR	—	75 PSIG	20 PSIG	—	KUNKLE 8209					↓	↓	⑭		B
	20	1	40# CONTAM STM	V397	↓	SST	STL	3	300 FLG	4	150 FLG	8000 #/HR	—	—	50 PSIG	↓	—	KUNKLE 8222		H615C ONLY			6450 -692	↓	⑯		B
	21	1	↓	V397	↓	SST	STL	4	↓	6	↓	15000 #/HR	—	—	↓	↓	—	KUNKLE 8254		H613C & H614C ONLY			↓	↓	(16A)		B
	22	1	S.W. COOLING	V555	SENTINEL	MONEL	BRZ	½	S.S.U.E.	½	S.S.U.E.	—	—	—	100 PSIG	—	—	KUNKLE 8207					6550 -361	↓	⑰		E
	23	1	↓	V556	↓	↓	↓	↓	↓	↓	↓	—	—	—	↓	—	—	↓					↓	↓	↓		E
	24	1	↓	V557	↓	↓	↓	↓	↓	↓	↓	—	—	—	↓	—	—	↓					↓	↓	↓		E
	25	1	↓	V558	↓	↓	↓	↓	↓	↓	↓	—	—	—	↓	—	—	↓					↓	↓	↓		E
	26	1	↓	V561	↓	↓	↓	↓	↓	↓	↓	—	—	—	110 PSIG	—	—	↓					↓	↓	↓		B
	27	1	↓	V562	↓	↓	↓	↓	↓	↓	↓	—	—	—	↓	—	—	↓					↓	↓	↓		B
	~~28~~	~~1~~	↓	~~V563~~	↓	↓	↓	↓	↓	↓	↓	—	—	—	↓	—	—	↓					↓	↓	↓		B
	29	1	↓	V564	↓	↓	↓	↓	↓	↓	↓	—	—	—	↓	—	—	↓					↓	↓	↓		B

ROUTING	CONTROL NO.		GROUP NO	LIST OF RELIEF VALVES	DRAWN	DATE	N N DRAWING NO. 257332	HULL NO.	SHEET NO.	REV
	SHOP	ERECTION			CHKD	APPD		613C 614C 615C	3	E

K+E HERCULENE® DRAFTING FILM 73157

NN27—11X17

257332

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

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4X

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
						MATERIAL		END CONNECTION					MANUFACTURER GUARANTEE					MANUFACTURER REFERENCE		BU SHIPS STD			LOCATION				
								INLET		OUTLET																	
PRINTS	ITEM NO.	NO PER SHIP	SERVICE	VALVE NO	TYPE	TRIM	BODY	SIZE	TYPE	SIZE	TYPE	CAPACITY (CONTR. CALC)	CAPACITY	MAX. OVER-PRESS.	SET PRESS	BACK PRESS.	HYDRO TEST	VALVE DESIGN	REPAIR PARTS	TYPE	CLASS	SPEC.	ARRGT. DWG.	PIPE OR EQUIP.	SOURCE OF MATL.	GROUP NO.	REV NO.
	30	1	S.W.-COOLING	V567	SENTI-NEL	MONEL	BRZ	½	SSUE	½	SSUE		—		110 PSIG	0		KUNKLE 8207					6550 -361	ON PIPE	6450-C7 ⑰		B
	31	1		V568																							B
	32	1		V569																							B
	33	1		V570																							B
	34	1		V571																							B
	35	1		V572																							B
	36	1		V573											↓												B
	37	1		V692											100 PSIG												E
	38	1		V693																							E
	39	1		V702																							E
	40	1		V703											↓												E
	41	1		V712											110 PSIG										↓		B
	42	1		V565											75 PSIG										⑱		B
	43	1		V566											↓										⑱		B
	44	1		V574											56 PSIG										⑲		B
	45	1	↓	V575	↓	↓	↓	↓	↓	↓	↓				↓	↓		↓							⑲		B
	46	1	S-W- SUPPLY FROM FIREMAIN	V606	RELIEF	BRONZE	STL GALV	6	150 FLG	6	150 FLG	3450 GPM	3745 GPM		135 PSIG	10 PSIG		KUNKLE 8202					↓		⑳		B
	47	1	HARBOR FEED PUMP SUCT	V742	SENTI-NEL	SST	STL	½	S.W.	½	S.W.	—	—	—	125 PSIG	—	—	KUNKLE 8212					6552 -372		㉑		B
	48	1	HARBOR FEED PUMP DISCH.	V743	RELIEF			1½	900# FLG	2	300 FLG	65 GPM	95 GPM		1253 PSIG	10 PSIG		KUNKLE 8205							㉒		B
	49	1	MN. FEED PUMP DISCH	V762				3		6	150 FLG	1400 GPM	1671 GPM		1380 PSIG	60 PSIG		KUNKLE 8206							㉓		B
	50	1	↓	V763	↓			↓	↓	↓		↓	↓		↓	↓		↓							㉓		B
	51	1	MN. FEED PUMP SUCT	V764	SENTI-NEL			1	150# FLG	1		—	—		125 PSIG	0		KUNKLE 8213							㉔		B
	52	1	↓	V765				↓	↓	↓	↓	—	—		↓			↓						↓	↓ ㉔		B
	53	1	4TH STAGE FEED HTR	V770				½	1500# SCRD	1"	SCRD	—	—		1380 PSIG			—						ON EQUIP	① 6450-C75		F
	54	1	5TH STAGE FEED HTR	V771					↓	↓	↓	—	—		↓			↓					↓		↓		F
	55	1	1ST STAGE FEED HTR	V850					150 FLG	½"	150# FLGD	—	—		230 PSIG			KUNKLE 8215					6552 -380		6450-C7 ㉘		B
	56	1	2ND STAGE FEED HTR	V854	↓							—	—		↓	↓							↓	↓	㉙		B
	57	1	DIESEL OIL TRANS PUMP DISCH	V958	RELIEF			↓		↓		10 GPM	44 GPM		50 PSIG	10 PSIG		↓					6950 -98	ON PIPE	㉚		B
	58	1	FUEL OIL TRANS PUMP DISCH	V964	↓	↓	↓	4	↓	4	↓	500 GPM	742 GPM		90 PSIG	25 PSIG		KUNKLE 8203					↓	↓	↓ ㉛		F

ROUTING	CONTROL NO. SHOP	CONTROL NO. ERECTION	GROUP NO	LIST OF RELIEF VALVES	DRAWN / CHKD	DATE / APPD	N N DRAWING NO. 257332

HULL NO.	SHEET NO.	REV
613C 614C 615C	4	F

K+E HERCULENE® DRAFTING FILM 73157

NN27—11X17

257332

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

KEUFFEL & ESSER CO.

SEPT. '80

4X

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
						MATERIAL		END CONNECTION					MANUFACTURER GUARANTEE					MANUFACTURER REFERENCE		~~SD SHIPS STD~~ REMARKS			LOCATION				
								INLET		OUTLET																	
PRINTS	ITEM NO.	NO PER SHIP	SERVICE	VALVE NO	TYPE	TRIM	BODY	SIZE	TYPE	SIZE	TYPE	CAPACITY (CONTR. CALC)	CAPACITY	MAX. OVER-PRESS.	SET PRESS	BACK PRESS.	HYDRO TEST	VALVE DESIGN	REPAIR PARTS	~~TYPE~~	~~CLASS~~	~~SPEC.~~	ARRGT. DWG.	PIPE OR EQUIP.	SOURCE OF MATL.	GROUP NO.	REV NO.
	59	1	F.O. SERVICE PUMP DISCH	V972	RELIEF	SST	STL	3/4	300 FLG	3/4	150 FLG	55 GPM	106 GPM		450 PSIG	0		KUNKLE					6950 -98	ON PIPE	6450-C7 ㉜		F
	60	1	↓	V973	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓	↓		KUNKLE 8216					↓	↓	㉜		F
	61	1	FUEL OIL HEATER	V974	SENTI-NEL	↓	↓	½	↓	1	↓	—	—		↓	30 PSIG		KUNKLE					↓	↓	㉝		B
	62	1	↓	V975	↓	↓	↓	↓	↓	↓	↓	—	—		↓	↓		KUNKLE 8217					↓	↓	㉝		B
	63	1	FUEL OIL RECIRC	V1007	RELIEF	↓	↓	1	150 FLG	1	↓	30 GPM	41 GPM		50 PSIG	↓		KUNKLE 8218					↓	↓	㉞		B
	64	1	DIESEL OIL	V1010	↓	↓	↓	↓	S.W.	↓	S-W.	↓	↓		↓	↓		KUNKLE 8219					↓	↓	㉟		B
	65	1	L.O. SERVICE PUMP DISCH	V1193	↓	↓	↓	4	150 FLG	4	150 FLG	950 GPM	1332 GPM		80 PSIG	5 PSIG		KUNKLE 8204					6200 -609	↓	㊱		B
	66	1	↓	V1194	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓	↓		↓					↓	↓	㊱		B
	67	1	SHIPS SERVICE AIR	V1648	↓	BRZ	BRZ	3/4	SCRD	3/4	SCRD	106 SCFM	319 SCFM		135 PSIG	↓		KUNKLE 1251					6454 -535	↓	㊳		B
	~~68~~	~~1~~	~~FIRE PUMP DISCH~~	~~V42~~	↓		~~STL~~	~~6~~	~~150 FLG~~	~~6~~	~~150 FLG~~	~~2000 GPM~~	~~—~~		~~135 PSIG~~	~~21 PSIG~~		~~KUNKLE 8253~~					~~2400 -959~~	↓	㊷		B
	~~69~~	~~1~~	~~↓~~	~~V51~~	↓	~~↓~~	~~↓~~	~~↓~~	~~↓~~	~~↓~~	~~↓~~	~~↓~~	~~—~~		~~↓~~	~~↓~~		~~↓~~					~~↓~~	↓	㊷		B
	70	1	STM TO F.O. HTRS	V507	↓	SST	STL	1½	↓	2½	↓	7200 #/HR	—		150 PSIG	10 PSIG		KUNKLE 8256		H613C H614C		& ONLY	6450 -692	↓	㊸		B
	71	1	S.W. TO MN. FEED PUMP L.O. CLR	V559	SENTI-NEL	BRZ	BRZ	½	SSUE	½	SSUE	—	—		45 PSIG	0							6550 -361	↓	㊹		B
	72	1	↓	V560	↓	↓	↓	↓	↓	↓	↓	—	—		↓	↓							↓	↓	㊹		B
	73	1	DRN. TRANS. P. DISCH TO AUX FD	V811	↓	SST	STL	↓	S.W.	↓	S.W.	—	—		150 PSIG	↓		KUNKLE 8252		H613C 614C		& ONLY	6552 -372	↓	㊺		B
	74	1	4TH STG. FEED HTR SHELL	V1314	↓	↓	SST	3/4	300 FLG	↓	150 FLG	—	—		230 PSIG	↓		KUNKLE 8255							㊻		B
	75	1	5TH ↓	V1322	↓	↓	↓	↓	↓	↓	↓	—	—		400 PSIG	↓		↓						ON EQUIP	㊼		B
	76	1	CONTAM. STM GEN-RELIEF	V452	RELIEF	↓	STL	4	FLG	6	FLG	—	—		250 PSIG	↓		DRESSER		H613 & 614C		ONLY	6450 -692	↓	6402-M2 ④		B
	77	1	↓	V452	↓	↓	↓	3	↓	3	↓	—	—		160 PSIG	↓		—		H615C		ONLY	↓	↓	↓		B
	78	1	1ST STAGE FD. HTR SHELL	V231	SENTI-NEL	BRONZE	BRONZE	½	SCR'D		SCR'D	—	—		15 PSIG	↓		—					6451 -471	↓	6400-T1		B
	79	1	2ND STAGE FD. HTR SHELL	V232	↓	↓	↓	↓	↓		↓	—	—		30 PSIG	↓		—					↓	↓	↓		B
	80	1	CONTROL AIR COMP. DISCHARGE	V1603	RELIEF	↓	↓	—	↓		↓	—	—		90 PSIG	↓		CONSOLIDATED 1542D	PF 482090				6351-T5 #5	↓	6351-T5		B
	81	1	DIESEL START AIR TK RELIEF	V1620	↓	↓	↓	½	↓		↓	—	—		225 PSIG	↓							6351 -535	↓	4002-C1		B
	82	1	CONTROL AIR RECEIVER	V1642	↓	↓	↓	—	↓		↓	—	—		90 PSIG	↓							↓	↓	6351-T5		B
	83	1	S.S. AIR RECEIVER RELIEF	V1652	↓	↓	↓	—	↓		↓	—	—		225 PSIG	↓							↓	↓	↓		B
	84	1	T.G. EXHAUST TO MN. CONDENSER	V215	SENTI-NEL	SST	SST	½	↓	½	↓	—	—		2 PSIG	↓		KUNKLE B4138					6451 -471	↓	4000-C1		B
	85	1	L.P. TURBINE	V216	↓	BRONZE	BRONZE	3	FLG		FLG	—	—		2 PSIG	↓		KUNKLE B7965					↓	↓			B
	86	1	MN. FD. PUMP #1 TURBINE	V217	↓	↓	↓	1	SCR'D		SCR'D	—	—		85 PSIG	↓		—					↓	↓	6350-T6		B
	87	1	MN. FD. PUMP #2 TURBINE	V218	↓	↓	↓	↓	↓		↓	—	—		↓	↓		—					↓	↓	↓		B

ROUTING

CONTROL NO.
SHOP
ERECTION

GROUP NO

LIST OF RELIEF VALVES

DRAWN
DATE
CHKD
APPD

N N DRAWING NO. 257332

HULL NO. 613C 614C 615C

SHEET NO. 5

REV F

K•E HERCULENE® DRAFTING FILM 73157

NN27—11X17

257332

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

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4X

PRINTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
						MATERIAL		END CONNECTION				CAPACITY (CONTR. CALC)	MANUFACTURER GUARANTEE					MANUFACTURER REFERENCE		~~SHIPS STD~~ REMARKS			LOCATION				
								INLET		OUTLET																	
	ITEM NO.	NO PER SHIP	SERVICE	VALVE NO	TYPE	TRIM	BODY	SIZE	TYPE	SIZE	TYPE		CAPACITY	MAX. OVER-PRESS.	SET PRESS	BACK PRESS.	HYDRO TEST	VALVE DESIGN	REPAIR PARTS	TYPE	CLASS	SPEC.	ARRGT. DWG.	PIPE OR EQUIP.	SOURCE OF MATL	GROUP NO.	REV NO.
	88	1	FIRE & TK. CLN. PUMP TURBINE	V219	SENTINEL	SST	SST	3/4"	SCR'D		SCR'D	—	—		75 PSIG	TO ATMOS		KUNKLE					6451-472	ON EQUIP	6350-T13		B
	89	1	C.O. PUMP #1 TURBINE	V220	↓	SST	SST	3/4"	↓		↓	—	—		5 PSIG	↓		KUNKLE FIG.#4	81938 -1				↓	↓	6350-C4		B
	90	1	↓ #2 ↓	V221	↓	↓	↓	↓	↓		↓	—	—		↓	↓		↓	↓				↓	↓	↓		B
	91	1	↓ #3 ↓	V222	↓	↓	↓	↓	↓		↓	—	—		↓	↓		↓	↓				↓	↓	↓		B
	92	1	↓ #4 ↓	V223	↓	↓	↓	↓	↓		↓	—	—		↓	↓		↓	↓				↓	↓	↓		B
	93	1	BALLAST P. TURBINE	V224	↓	SST	SST	1/2"	SCR'D		SCR'D	—	—		5 PSIG	↓		KUNKLE FIG.40R	—				↓	↓	6350-T3		B
	94	1	DFT SHELL	V233	RELIEF	BRONZE	BRONZE	4"	150# FLG	4"	150# FLG	—	—		85 PSIG	↓		CONSOLIDATED 1485	—				↓	↓	6400-T2 ⑩		B
	95	1	MN STM STBD BLR SUPHTR	V19	↓	SST	CR-MO	2 1/2"	1500# FLG	4"	150# FLG	50,382 #/HR	—		1055 PSIG	↓		CROSBY B49676	—				6440 -505	↓	6800-M1		B
	96	1	↓ ↓ PORT BLR SUPHTR	V20	↓	SST	CR-MO	2 1/2"	1500# FLG	4"	150# FLG	50,382 #/HR	—		1055 PSIG	↓		CROSBY B49676	—				↓	↓	↓		B
	97	1	↓ ↓ STBD BLR DRUM PILOT	V29	↓	SST	STL	1 1/2"	1500# FLG	2 1/2"	150# FLG	15,216 #/HR	—		1055 PSIG	↓		CROSBY D46182-4	—				↓	↓	↓		B
	98	1	↓ ↓ STBD BLR DRUM	V30	↓	SST	STL	2 1/2"	1500# FLG	4"	150# FLG	64,967 #/HR	—		1075 PSIG	↓		CROSBY B49675	—				↓	↓	↓		B
	99	1	↓ ↓ PORT BLR DRUM PILOT	V31	↓	SST	STL	1 1/2"	1500# FLG	2 1/2"	150# FLG	15,216 #/HR	—		1055 PSIG	↓		CROSBY D46182-4	—				↓	↓	↓		B
	100	1	↓ ↓ PORT BLR DRUM	V32	↓	SST	STL	2 1/2"	1500# FLG	4"	150# FLG	64,967 #/HR	—		1075 PSIG	↓		CROSBY B49675	—				↓	↓	↓		B
	101	1	↓ ↓ STBD BLR, SUPHTR SAFEY	V45	↓	SST	CR-MO	2 1/2"	1500# FLG	4"	150# FLG	84,152 #/HR	—		1045 PSIG	↓		CROSBY C58502	—				↓	↓	↓		B
	102	1	↓ ↓ PORT BLR, SUPHTR SAFEY	V46	↓	SST	CR-MO	2 1/2"	1500# FLG	4"	150# FLG	84,152 #/HR	—		1045 PSIG	↓		CROSBY C58502	—				↓	↓	↓		B
	103	1	↓ ↓ PORT BLR DRUM SAFETY	V55	↓	SST	STL	2 1/2"	1500# FLG	4"	150# FLG	64,371 #/HR	—		1065 PSIG	↓		CROSBY B49675	—				↓	↓	↓		B
	104	1	↓ ↓ STBD BLR DRUM SAFETY	V56	↓	SST	STL	2 1/2"	1500# FLG	4"	150# FLG	64,371 #/HR	—		1065 PSIG	↓		CROSBY B49675	—				↓	↓	↓		B
	105	1	VACUUM BREAKER (FOR DFT)	V281	VACUUM BREAKER	BRASS	BRONZE	2"	SCR'D		SCR'D		—		4" HgV	↓		McALEAR No. 308	—				6400-T2 #2	↓	FURN WITH DFT		B
	106	2	MN AIR EJECTOR 1ST STAGE RELIEF	—	RELIEF		↓	—		—					10 PSIG	↓		—	—				6351-T1 #5	↓	FURN WITH MN AIR EJ.		B
	107	1	S.S. AIR COMPRESSOR -INTERCOOLER	—	↓		IRON	1"		—					60 PSIG	↓		—	—				6351-C2	↓	FURN WITH AIR COMP.		B
	108	1	COOL WATER TO HARBOR FEED PUMP	V1137	↓		STL	1/2"	SCR'D	-	SCR'D	—			50 PSIG	↓		—	—				6552382	ON PIPE	S/26-16-132		F
	109	1	L.O. PURIFIER-SUCT PUMP RELIEF	V1257	↓	SST	STL	—	S.W.	-	S.W.				15 PSIG	↓		—	—				6200-609	ON EQUIP	FURN WITH PURIFIER		B
	110	1	L.O. PURIFIER-DISCH PUMP RELIEF	V1258	↓	SST	STL	—	S.W.	-	S.W.				45 PSIG	↓		—	—				↓	↓	↓		B
	111	1	L.O. HTR RELIEF	V1269	↓	BRONZE	BRONZE	1/2"	SCR'D	1/2"	SCRD				50 PSIG	↓		CRANE FIG2601	—				6200-623	↓	S/2616152		C
	112	1	DISTL PLANT #1	V1836	↓	↓	↓	1"	↓	1	↓				15 PSIG	↓		CNSLD No 1543	—				6557-89	↓	FURN WITH DISTL		D
	113	1	DISTL PLANT #2	V1837	↓	↓	↓	3/4"	↓	3/4"	↓				↓	↓		↓	—				↓	↓	↓		D
	114	3	CONDENSATE DEOILER	V485A V485B V485C	↓	↓	↓	—	↓	-	↓				75 PSIG	↓		DRESSER 1478	—				—	↓	FURN. WITH DEOILER		D
	115	1	S.W. COOLING TO GALLEY A/C UNIT	V-2458	SENTINEL	↓	↓	1/2"	↓	1/2"	↓				110 PSIG	↓		KUNKLE FIG. 20	—				6550-421	ON PIPE	—		D
	116	1	BILGE & BALL. SYS IN ENG.-RM	V-1593	RELIEF	↓	D.I.	6"	FLG	6"	FLG				75 PSIG	↓		KUNKEL 8253	—	USE SPRING ① ON PO 6450-C69			2280-682	↓	PO ㊷ 6450-C7		E

ROUTING	CONTROL NO. SHOP	CONTROL NO. ERECTION	GROUP NO	LIST OF RELIEF VALVES	DRAWN	DATE	N N DRAWING NO. 257332
					CHKD	APPD	
HULL NO. 613C 614C 615C	SHEET NO. 6	REV F					

K+E HERCULENE® DRAFTING FILM 73187

MN27—11X17

257332

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

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4X

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
PRINTS	ITEM NO.	NO PER SHIP	SERVICE	VALVE NO	TYPE	MATERIAL		END CONNECTION				CAPACITY (CONTR. CALC)	MANUFACTURER GUARANTEE		SET PRESS	BACK PRESS.	HYDRO TEST	MANUFACTURER REFERENCE		BU SHIPS STD			LOCATION		SOURCE OF MATL	GROUP NO.	REV NO.
								INLET		OUTLET																	
						TRIM	BODY	SIZE	TYPE	SIZE	TYPE		CAPACITY	MAX. OVER-PRESS.				VALVE DESIGN	REPAIR PARTS	TYPE	CLASS	SPEC.	ARRGT. DWG.	PIPE OR EQUIP.			
	88	1	HOT WATER HEATER TANK	—	RELIEF	BRONZE	BRONZE	1"	SIL-BRZ	1"	SIL-BRZ				127 PSIG	0		T&P	40XL-1"				—	ON TANK	6402-T2 ②		F
	89	1	POTABLE WATER PRESSURE TANK	V-6007	RELIEF	STEEL	BRASS	1"	M.P.T.	1"	F.P.T.				110 PSIG	0		CRANE	2601				2350-1353	ON TANK	2350-C6 ①		G
	90	1	F.M. DISCH MOTOR DRIVEN FIRE PUMP	V42FM	RELIEF	BRONZE	DUCTILE IRON	4"	150# FLG	6"	150# FLG	2000 GPM			195 PSIG	0-25		FARRIS	26PB10				2400-1124	—	2400-C80 ①		F
	91	1	F.M. DISCH TURBINE DRIVEN FIRE PUMP	V51FM	RELIEF	BRONZE	DUCTILE IRON	4"	150# FLG	6"	150# FLG	2000 GPM			195 PSIG	↓		FARRIS	26PB10				2400-1020	P38-6"	2400-C80 ①		F
	92	1	SEWAGE AIR BLOWER DISCH	V5021	RELIEF	—	—	1"	F.P.T	—	—	0			10 PSIG	0		ROOTS CONNERSVILLE	D-12527				2500-2261	P7AF-1½"	2504-M4 (1-0)		F
	93	1	FEED PUMP #1 GLAND RELIEF	—	RELIEF	—	BRONZE	1½"	M.P.T	1½"	F.P.T.	0			112 PSIG MIN 115 PSIG MAX	0		COFFIN	798					ON PUMP	6350-T6		F
	94	1	FEED PUMP #2 GLAND RELIEF	—	RELIEF	—	BRONZE	1½"	M.P.T	1½"	F.P.T.	0			↓	0		COFFIN	798					ON PUMP	6350-T6		F
	95	1	AUX L.O. TRANSF. PMP RELIEF	V-1280	RELIEF	—	BRONZE	1½"	F.P.T.	1½	F.P.T.	0			100 PSIG	0		—	—				6200-623	—	26-16-160		F
	96	1	CONDS. TO SMOKE IND. CLEANING	⑩	↓	—	↓	½"	SCRD	-	-				70 PSIG	0		—	-				6552-382	-	S		F

ROUTING	CONTROL NO. SHOP	ERECTION	GROUP NO	LIST OF RELIEF VALVES	DRAWN CHKD	DATE APPD	N N DRAWING NO. 257332	HULL NO. 613C 614C 615C	SHEET NO. 7	REV G

K•E HERCULENE® DRAFTING FILM 73187

NN27—11X17

257332

MICRO-MASTER® 105 mm

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DESCRIPTION	SOURCE OF MAT'L	FOUNDATION DWG NO.	GROUP NO.	DRY WT.	WET WT.
RT BOILER	P.O.6800-C1	1020-65	6800-0114-1201 SI	289,000#	355,000#
BD BOILER	↓	↓ ↓	6800-0114-1101 SI	↓	↓
DUCTION GEAR	P.O.6100-C1	1060-73	6100-0108-1001 SI	333,767#	—
RUST BEARING	↓	↓	6100-0108-1002 SI	75,410#	—
IN CONDENSER	P.O.6250-C1		6250-0108-1001 SI	230,000#	380,000#
. TURBINE .	P.O.6100-C1		6100-0108-1003 SI	128,000#	—
. TURBINE	↓	↓ ↓	6100-0108-1004 SI	45,679#	—
MOSPHERIC CONDENSER	P.O.6250-C1	1220-2589 SH 51	6250-0101-1001 SI	17,000#	23,000#
EADY BEARING	P.O.6302-C1	1060-73	6302-0108-1001 SI	5,600#	5,900#
EL GEN L.O. TANK	M.O.6150-177 S.8 L.1	—	6150-0117-1001-PI	1300#	5300#
ERN TUBE DRAIN TK	P.O.6302-C2	1220-2590 SH 11	6302-0109-1001 PI	258#	477#
LER WASHDOWN STRAINER TK	M.O.6150-177 S.6 L.1	SH 8	6150-0106-1001 PI	—	1700#
BILGE SUMP PUMP	P.O.6350-T16	↓ SH 7	6350-0103-1001 PI	338#	400#
GE & BALLAST PMP #1	P.O.6350-T16	1220-2589 SH 9	6350-0103-1201 PI	1437#	1473#
GE & BALLAST PMP #2	↓	1220-2590 SH 6	6350-0103-1202 PI	1437#	1473#
GE & BALLAST PRIMING UNIT	P.O.6350-T9	1220-2589 SH 7	6350-0105-1201 PI	862#	932#
SEL GEN S.W. PMP	P.O.6350-T7	1220-2589 SH 12	6350-0102-1202 PI	1030#	1055#
D. HEATER	P.O.6402-C2	1220-2590 SH 5	6402-0106-1101 PI	125#	155#
D. PURIFIER	P.O.6351-T3	SH 4	6351-0106-1101-PI	870#	-
STILLING PLANT FEED PMP #1	P.O.6350-T16	SH 9&10	6350-0106-1103 PI	—	246#
STILLING PLANT FEED PMP #2	P.O.6350-T16	↓ SH 9&10	6350-0103-1103 PI	462#	474#
D. SUCTION STRAINER	P.O.6200-M4	1220-2589 SH 14	6200-0102-1101 PI	7000#	—
D. DISCHARGE STRAINER	P.O.6200-M4	SH 15	6200-0105-1001 PI	6000#	—
D. SERVICE PMP #1	P.O.6350-T8	SH 22	6350-0102-1104 PI	3,558#	-
D. SERVICE PMP #2	↓	SH 22	6350-0102-1104 PI	3,558#	—
IN L.O. COOLERS	P.O.6402-C1	SH 13	6402-105-1101 PI	8,800#	14,000#
. SERVICE PMP #1	P.O.6350-T16	SH 10&11	6350-0101-2204 PI	1572#	1608#
. SERVICE PMP #2	↓	SH 10&11	6350-0101-2204 PI	1572#	1608#
V. SCRUBBER PMP #2	P.O.6350-T16	↓ SH 23	6350-0101-2205 PI	2363#	2411#
LIGHTING TRANSFORMERS	P.O.4100-C1	—	4100-0112-1001 SI	660# EACH	—
CONDENSATE PMP #1	P.O.6350-T7	1220-2589 SH 6	6350-0101-1206 PI	2000#	—
CONDENSATE PMP #2	↓	SH 6	6350-0101-1206 PI	2000#	—
CIRC PMP #1	P.O.6350-T7	SH 4	6350-0101-1107 PI	11,100#	14,000#
CIRC PMP #2	↓	SH 5	6350-0101-1107 PI	11,100#	14,000#
D. TRANSFER PMP	P.O.6350-T8	SH 17	6350-0101-1001 PI	2613#	—
LLAST PMP TURBINE	P.O.6350-T3	SH 30	6350-0101-2101 PI	—	15,200#
RGO OIL PMP TURBINE #1	P.O.6350-C4	SH 31	6350-0101-1002 PI	—	25,650#
RGO OIL PMP TURBINE #2		SH 33	6350-0101-1002 PI	—	25,650#
RGO OIL PMP TURBINE #3		SH 34	6350-0101-1002 PI	—	25,650#
RGO OIL PMP TURBINE #4	↓	SH 32	6350-0101-1002 PI	—	25,650#
RE PUMP	P.O.6350-T13	SH 29	6350-0101-2201 PI	7,350#	—
ERGENCY FIRE PUMP	P.O.6350-T7	↓ SH 26	6350-0101-2203 PI	3950#	—
AIN FEED PMP #1	P.O.6350-T6	1220-2602 SH 4	6350-0106-1011 PI	4210#	—
AIN FEED PMP #2	↓	SH 4	6350-0106-1011 PI	4210#	—
O. PUMP #1	P.O.6350-T8	SH 6	6350-0106-1001 PI	1381#	—
O. PUMP #2	↓	SH 6	6350-0106-1001 PI	1381#	—
O. SUCTION STRAINER	P.O.6350-M7	SH 7	6350-0106-1102 PI	480#	—
O. HEATERS	P.O.6402-T5	↓ SH 5	6402-0114-2201 PI	590# EACH	750# EACH
ESEL OIL PMP	P.O.6350-T8	1220-2608 SH 8	6350-0115-1201-SI	221#	—
RAULIC THROTTLE CONTROL ASSY	P.O.6100-C1	1220-2603 SH 8	6100-105-1001 PI	1050#	—
GLAND EXHAUST FAN	P.O.6351-M4	↓ SH 10	6351-0111-1201-PI	444#	—
NDENSATE DE-OILER	P.O.6400-C4	—	6400-0104-1201 PI	2600#	7000#
GE & BALLAST PRIMING TANK	P.O.6350-T8	—	6350-0105-1201 PI	-	300#
R EJECTOR	P.O.6351-T1	1220-2603 SH 9	6351-0104-1201 PI	10,250#	—
NTAMINATED ST GEN	P.O.6402-C2	—	6402-0104-1101 PI	37,600#	65,500#
ERN TUBE L.O. PRESS CONTROL UNIT	P.O.6302-C2	1220-2590 SH 16	6302-106-1004 PI	76#	—
HROTTLE CONTROL BOARD	N.N. DWG 6755-53	N.N. DWG 6755-53	N.N. DWG 6755-53	—	—
OP TK DR CNDS COOLER	P.O.6402-C2	1220-2603 SH 16	6402-0104-1202 PI	780#	—
NTROL AIR COMP MODULE	P.O.6351-C5	↓ SH 6	6351-0104-1102 PI	2682#	2834#
ONTROL AIR RECEIVER	P.O.6351-C5	—	6351-0104-1102 PI	4440#	—
ONTROL AIR REFRIGIFILTER #1	P.O.6351-C5	1220-2603 SH 11	6351-0104-1102 PI	195#	—
EAN RAG LOCKER	NN DWG 6150-175	—		-	-
EWAGE TREATMENT PLANT	P.O.2504-C1	—	2504-0104-1201 PI	8000#	38000#
& 2ND STG FEED HTR	P.O.6400-T1	1220-2607 SH 5	6400-0113-1202 PI	1ST 4000# 2ND 2600#	1ST 6900# 2ND 3500#
LY RAG LOCKER	NN DWG 6150-175	—		—	—
OILER WTR TEST CABINET	P.O.6557-C1	—	6557-0114-1101 SI	914#	—
TH & 5TH STG FEED HTR	P.O.6400-T1	1220-2607 SH 6	6400-0113-1101 PI	4TH 6500# 5TH 6000#	4TH 8650# 5TH 7460#
STILLING PLANT #1	P.O.6400-C1	—	6401-0115-1101 PI	—	9100#
STILLING PLANT #2	P.O.6401-C1	—	6401-0113-1101 PI	7800#	9300#
OTABLE WTR PMP #1	P.O.6350-T16	1220-2608 SH 5	6350-0115-1101 PI	366#	—
OTABLE WTR PMP #2	↓	↓ SH 5	6350-0115-1101-PI	366#	—

ITEM	DESCRIPTION	SOURCE OF MAT'L	FOUNDATION DWG NO.	GROUP NO.	DRY WT.	WET WT.
72	HOT WATER HTR.	P.O.6402-T2	—	6402-0115-1101-PI	—	2500#
73	POTABLE WATER TK	P.O.2350-C6	1220-2608 SH 4	2350-0110-1101-PI	—	5500#
74	MN ENGINE CONSOLE	P.O.6755-M1	—	6755-0115-1001-SI	8000#	—
75	SWITCHBOARD	P.O.4050-C1A	—	4100-0115-1003-SI	17,000#	—
76	A/C UNIT	P.O.2670-C2	—	2670-0115-1001-SI	425#	—
77	A/C UNIT	↓	—	2670-0115-1001-SI	425#	—
78	LOG DESK	HOPEMAN	—	X 32	—	—
79	AUX CONDENSATE PMP #2	P.O.6350-T7	1220-2589 SH 40	6350-0101-2206-PI	1700#	—
80	A/C COMPRESSOR #1	P.O.2670-C1	1220-2636 SH 8	2670-0117-1201-PI	—	5300#
81	A/C COMPRESSOR #2	↓	SH 8	2670-0117-1201-PI	—	5300#
82	REFRIG. COMPRESSOR #1	P.O.2670-C1	SH 5	2670-0117-1101-PI	—	2000#
83	REFRIG. COMPRESSOR #2	↓	↓ SH 5	2670-0117-1101-PI	—	2000#
84	FORCED DRAFT BLOWER #1	P.O.6901-C1	1220-2964 SH 3	6901-1601-1001-PI	6809#	—
85	FORCED DRAFT BLOWER # 2		SH 3	6901-1601-1001-PI	6809#	—
86	FORCED DRAFT BLOWER #3		SH 4	6901-1601-1001-PI	6809#	—
87	FORCED DRAFT BLOWER #4	↓	↓ SH 4	6901-1601-1001-PI	6809#	—
88	REGENERATIVE AIR HTR #1	P.O.6800-C1	1270-602	6800-1601-1001-PI	95,660#	—
89	REGENERATIVE AIR HTR #2	↓		6800-1601-1001-PI	95,660	—
90	DEAERATING FEED TK	P.O.6400-T2		6400-1601-1001-PI	17,300#	89,700#
91	INERT GAS PLANT	P.O.2730-C1		2730-1601-1003-PI	75,000#	—
92	HYDR VLV CONT POWER PACK	P.O.2300-C1		2300-1601-1001-PI	4000#	4200#
93	L.O. GRAVITY TK	MO 6150-177 SH 11 L.1	↓ ↓	6150-1601-1001-PI	9670#	53,900#
94	F.O. DISCHARGE STRAINER	GROUPED WITH F.O. PIPE	NONE	GROUPED WITH F.O. PIPE	—	—
95	SS. TURBO GENERATOR	P.O.4000-C1	1220-2608 SH 6&7	4000-0115-1201-SI	44,790#	—
96	F.W. TRANSFER PMP #1	P.O.6350-T16	1220-2589 SH 41&42	6350-0101-2202-PI	365#	366#
97	F.W. TRANSFER PMP #2	↓	SH 41&42	6350-0101-2202-PI	365#	366#
98	F.W. DRAIN TK	MO 6150-177 SH 15 L.1	↓ SH 39	6150-0104-2201-PI	1820#	6310#
99	S.S. AIR COMPRESSOR MODULE	P.O.6351-C2	—	6351-0104-1103-PI	4900#	—
100	HARBOR FEED PUMP	P.O.6350-C18	1220-2603 SH 7	6350-0105-1011-SI	7,840#	—
101	DIESEL GENERATOR	P.O.4002-C1	1220-2607 SH 10	4002-0113-1201-SI	59,600#	62,980#
102	BILGE & BALLAST OILY WATER SEP.	P.O.2400-C1	—	2280-0105-1202 SI	2,500#	4,000#
103	EMERGENCY SEWAGE PUMP #1	P.O.2504-T2	1220-2589 SH 45	2504-0105-1201-PI	—	1000#
104	EMERGENCY SEWAGE PUMP #2	↓	↓ SH 45	2504-0105-1201-PI	—	1000#
105	LUBE OIL WORK BENCH	ON DWG 6650-232	—	ON DWG 6650-232	—	—
106	OILY WATER SEPARATOR BILGE PUMP	P.O.2400-C1	1220-2590 SH 15	2280-0103-1101-PI	200#	—
107	OIL TANK LEVEL GAGES	P.O.2287-C1	—	SEE DWG 2287-145	—	—
108	CONTROL AIR REFRIGIFILTER #2	P.O.6351-C5	1220-2603 SH 11	6351-0104-1102 PI	195#	—
109	SOOT BLOWER #1 P	P.O.6800-C1	1220-2636 SH 6&7	6800-0118-1201-SI	1160#	—
110	SOOT BLOWER #1 S		↓ SH 6&7	6800-0118-1101-SI	1160#	—
111	SOOT BLOWER #2 P		1220-2607 SH 7&8	6800-0114-1202-SI	1160#	—
112	SOOT BLOWER #2S	↓	↓ SH 7&8	6800-0114-1102-SI	1160#	—
113	BOILER GAGEBOARD	P.O.6755-C1	—	6755-0114-1001-SI	750#	—
114	AUX S.W. CIRC 8" DUPLEX STRAINER	P.O.6550-N13	1220-2603 SH 12	6550-0104-1201-PI	1260#	—
115	SEWAGE TANK BLOWER	P.O.2504-C4	↓ SH 15	2504-0105-1202-PI	243#	—
116	SPARE FREON BOTTLES		1220-2636 SH 4		—	—
117	CONTROLLER FOR EMER FIRE PUMP	P.O.6350-C15	—	4100-0104-1001-PI	—	—
118	CONT FOR MAIN CIRC PUMP #1	P.O.6350-C15	—	4100-0104-1001-PI	—	—
119	CONT FOR MAIN CIRC PUMP #2	↓	—	4100-0104-1001-PI	—	—
120	POWER SUPPLY CATHODIC PROTECTION PANEL #1	P.O.4100-C5	—	4100-0106-1001-PI	755#	—
121	DIESEL START AIR RECEIVER #1	P.O.4002-C1	1220-2607 SH 9	4002-0117-1201-PI	450#	—
122	DIESEL START AIR RECEIVER #2	↓	1220-2607 SH 9	4002-0117-1201-PI	450#	—
123	USED OIL TANK	MO 6150-177 S.3 L.1	1220-2590 SH 13	6150-0106-1103-PI	225#	670#
124	LUBE OIL PURIFIER DRAIN TANK	MO 6150-177 S.4 L.1	1220-2589 SH 36	6150-0102-1101-SI	205#	420#
125	CONT FOR MAIN CNDS PUMP #1	P.O.6350-C15	—	4100-0104-1001-PI	—	—
126	CONT FOR MAIN CNDS PUMP #2	↓	—	4100-104-1001-PI	—	—
127	CHEMICAL FEED TANK	P.O.6401-C1	1220-2608 SH 9	6401-0115-1101-SI	125#	300#
128	GREASE EXTRACTOR	P.O.6400-T3	1220-2636 SH 5	6400-0117-1201-PI	3250#	4950#
129	AIR FILTER FOR AUX. DIESEL GEN.	P.O.4002-C1	1220-2607 SH 13	4002-0117-1202-PI	200#	—
130	AMINE INJECTOR	P.O.6553-C1	SH 12	6552-0114-1101-PI	365#	—
131	S.W. STR FOR AUX. DSL. GEN. COOL.	P.O.6550-N13	↓ SH 11	6550-0114-1201-PI	745#	—
132	WATERTIGHT SLIDING DOOR	P.O.2212-C1	—	2218-0405-1001-SI	—	—
133	DEIONIZER	P.O.6552-C17	—	6552-0105-1203-PI	2120#	6241#
134	AIR REFRIGIFILTER FOR SOOTBLOWERS & VAC-STRIP	P.O.6454-C7	1220-2603 SH 19	6454-0104-1201-PI	285#	—
135	AUX GLAND EXHAUST CONDENSER	P.O.6402-C2	↓ SH 18	6402-0104-1203-PI	1200#	—
136	BURNER TIP WORKBENCH	ON DWG 6650-236	—	ON DWG 6650-236	—	—
137	POWER SUPPLY CATHODIC PROTECTION PANEL #2	P.O.4100-C5	—	4100-0106-1001-PI	755#	—
138	AUX CONDENSATE PMP #1	P.O.6350-T7	1220-2589 SH 40	6350-0101-2206-PI	1700#	—
139	S.W. SCRUBBER PMP #1	P.O.6350-T16	SH 24	6350-0101-2205-PI	2363#	2411#
140	FWD BILGE SUMP PUMP	P.O.6350-T16	↓ SH 35	6350-0101-1004-PI	338#	400#
141	DRINKING FOUNTAIN	HOPEMAN	—	X 42	—	—
142	PHONE BOOTH	—	—	X 32	—	—

ITEM	DESCRIPTION	SOURCE OF MATERIAL	FOUNDATION DWG NO.	GROUP NO.	DRY WT.	WET WT.
143	PORT SMOKE INDICATOR	ON DWG 6900-82	—	ON DWG 6900-82	—	—
144	STBD SMOKE INDICATOR	↓	—	↓	—	—
145	PORT PUMP ROOM FAN MOTOR	P.O.6350-C14	1220-2603 SH 21	6350-0110-1002-PI	400#	—
146	STBD PUMP ROOM FAN MOTOR	↓	SH 21	6350-0110-1002-PI	400#	—
147	MOTORS (QTY.5) FOR VAC-STRIP PUMPS	(4) 6350-T1 (1) 6350-T2	↓ SH 13&16	6350-0104-1001-PI	272# EACH	—
148	CIRCOOLMATIC ASSEMBLY	P.O.6302-C2	1220-2602 SH 9	6302-0106-1201 SI	190#	240#
149	OIL CONTENT SAMPLING PUMP #3	P.O.2400-C22	1220-2589 SH 53	2280-0104-1002 PI	—	120#
150	OIL CONTENT SAMPLING PUMP #1	↓	↓ SH 56	2280-0104-1002 PI	—	120#
151	TOXION INJECTION TANK	P.O.6553-C1	1220-2603 SH 22	6552-0105-1201 SI	125#	—
152	STERN TUBE PRESSURE HEAD TANK	P.O.6302-C2	1220-2590 SH 17	6302-0106-1003 PI	445#	810#
153	WORK TABLE	HOPEMAN	—	X 32	—	—
154	AE & OVFL CONTAINMENT TANK	MO 283206	—	6150-0118-1001 PI	—	—
155	OIL CONTENT SAMPLING PUMP #2	P.O.2400-C22	1220-2589 SH 58	2280-0104-1002 PI	—	120#
156	LUBE OIL TK LVL GAGE	P.O.2287-C1	—	2287-0115-1001 SI	—	—
157	POTABLE & DISTILLED WTR TK LVL GA	②	—		—	—
158	FUEL & DIESEL OIL TK TK GAGE	↓ ①	—	↓	—	—
159	FDB ACTUATOR (INLET VANE)	DWG 6901-26	DWG 6901-26	DWG 6901-26	—	—
160	FDB ACTUATOR (OUTLET VANE)	↓	↓	↓	—	—
161	AUX L.O. PUMP	P.O.6350-C54	LINGOU NR MEM-567	6350-0101-1108 PI	221#	—

REVISIONS

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTH	OWNER DATE	OWNER APPD
A	—	INITIAL ISSUE	6/9/76		—	-
B	—	ADDED: ITEMS 142 THRU 153; AND VARIOUS LADDERS, GRATINGS, & ARCHES THROUGHOUT MACHINERY SPACE. ADDED STOREROOM ON 78'-4" LVL. ALTERED: E.O.S. OUTLINE AND WINDOWS; TROLLEY TRACK AND ASSOCIATED LIFTING OPENINGS; WORKSHOP; AND LOCATION OF ITEMS 11, 92, 99, 115, 124, 134, & 136. ALL OF THE ABOVE TO SUIT DESIGN DEVELOPMENTS.				
	—	ADDED: ITEMS 10, 55 & 56 TO SUIT DESIGN DEVELOPMENT.				
	—	ALTERED: LOCATION OF MAIN ENGINE CONSOLE, ITEM 74, IN E.O.S.	1/11/77		—	—
C	—	ADDED: "SOURCE OF MATERIAL" & "FOUNDATION DWG NO." TO ITEMS 1 THRU 153.				
		ADDED ITEM 154 & 155. MOVED OIL TK LVL GAGES, ITEM 107 TO EOS. LOCATED NEW DEIONIZER MODULE ITEM 133. ADDED WET & DRY WEIGHTS.			—	—
D	—	ALTERED LOCATION LADDER ACCESS OPENING FORWARD OF L.O. STORAGE TK. ADDED THROTTLE CONTROL BOARD. ALT'D GROUP NOS OF ITEMS 20, 72, 75, 91, 107, 124, 129.	2/1/78		—	—
E	-	ADDED ITEMS 156, 157, 158 & STOREROOM ON 78'-4" FLAT				
		ADDED 4 ITEMS 159 ON 60'-0" LVL ADDED 4 ITEMS 160 ON 106'-0" LVL				
		ADDED ITEM 62 & 65 IN ENGR WORKSHOP AREA				
		ADDED AUX L.O. PUMP ITEM 161.	4/5/79			

AUTHORITY:

GENERAL NOTES:

FOR ELEV & SECT SEE DWG № 257704

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C 613C	310 309	

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

SCALE 1/4" = 1 FT
DRAWN E.R. SMOOT
CHECKED J.H.J.
SECT MGR J.H. Johnson
DATE COMPL. 6-9-76
EXAMINED —
AUTHORIZED E.F. Stephens
DATE 6-9-76
TECH APPROVAL NOT REQ'D
C S D APPROVAL R. L. Harrington

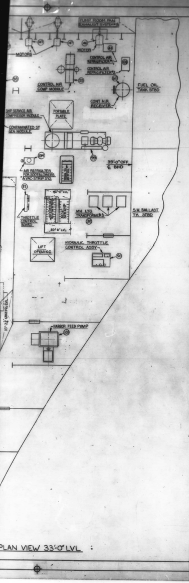
ARRANGEMENT OF MACHINERY
ENG ROOM - PLAN

U S M A DESIGN T11-S-116A
U S M A DWG NO. —
HULL NO. —
DWG NO. 257703
REV E
SHEET NO. 1 OF 1

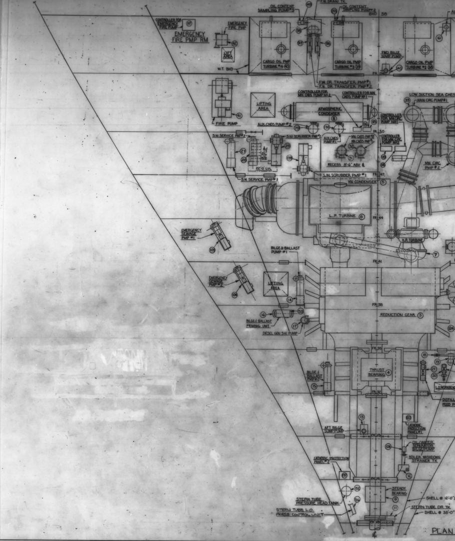
REFERENCES
DWG NO.

257703

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 1


PUMP ROOM FAN EXHAUST SWITCH
MOTORS
MOTOR
CONTROL AIR REFRIGFILTER #1
CONTROL AIR REFRIGFILTER #2
CONTROL AIR COMP MODULE
CONT AIR RECEIVER
FUEL OIL TANK STBD
SHIP SERVICE AIR COMPRESSOR MODULE
PORTABLE PLATE
CONTAMINATED ST GEN MODULE
AIR REFRIGFILTER FOR SOOTBLOWERS & VAC-STRIP SYS
35'-0" OFF ℄ BHD
THROTTLE CONTROL BOARD
MN LTG TRANSFORMERS
S.W. BALLAST TK STBD
LIFT OPENING
HYDRAULIC THROTTLE CONTROL ASSY
HARBOR FEED PUMP

PLAN VIEW 33'-0" LVL :


OIL CONTENT SAMPLING PUMP #3
F.W. DRAIN TK
OIL CONTENT SAMPLING PUMP #2
AUX L.O. PUMP
OIL CONTENT SAMPLING PUMP #1
CONTROLLER FOR EMERGENCY FIRE PUMP
EMERGENCY FIRE PMP RM
EMERGENCY FIRE PMP
LIFT AREA
W.T. BHD
CARGO OIL PMP TURBINE #4
CARGO OIL PMP TURBINE #3
FWD BILGE SUMP PUMP
CARGO OIL PMP TURBINE #2
CARGO OIL PMP TURBINE #1
BALLAST PMP TURBINE
F.W. DR TRANSFER PMP #1
F.W. DR TRANSFER PMP #2
CONTROLLER FOR MN CNDS PUMP No 2
CONTROLLER FOR MN CNDS PUMP No 1
SLUDGE TANK IN INNERBOTTOM
FUEL & DIESEL OIL TK LVL GAGE
F.O. TRANSFER PMP
LOW SUCTION SEA CHEST
MAIN CIRC PUMP #1
LIFTING AREA
ATMOSPHERIC CONDENSER
HIGH SUCTION SEA CHEST
FIRE PUMP
AUX CNDS PUMP #2
AUX CNDS PUMP #1
MN CNDS PMP #2
MN CNDS PMP #1
CONTROLLER FOR MN CIRC PUMP No 1
CONTROLLER FOR MN CIRC PUMP No 2
S.W. SERVICE PMP #2
S.W. SCRUBBER PMP #2
22'-0" LVL
RECESS 15'-6" ABV ℄
LADDER UP TO 33'-0" LVL
MN CIRC PMP #2
S.W. SERVICE PMP #1
S.W. SCRUBBER PMP #1
MN CONDENSER
L.P. TURBINE
H.P. TURBINE
L.O. DISCHARGE STRAINER
L.O. SERVICE PUMP #1
EMERGENCY SEWAGE PMP #1
BILGE & BALLAST PUMP #1
L.O. SERVICE PUMP #2
L.O. SUCTION STRAINER
MAIN L.O. COOLERS
EMERGENCY SEWAGE PMP #2
REDUCTION GEAR
BILGE & BALLAST PRIMING UNIT
DIESEL GEN S.W. PUMP
LUBE OIL PURIFYING DRAIN TANK
L.O. HEATER (NEAR)
USED OIL TANK
L.O. PURIFIER
THRUST BEARING
BILGE & BALLAST PMP #2
DISTILLING PLANT FEED PUMP #1
L.O. WORKBENCH
DISTILLING PLANT FEED PUMP #2
AFT BILGE SUMP PUMP
CATHODIC PROTECTION PANEL #1
OIL/WATER SEPARATOR
BOILER WASHDOWN STRAINER TK
CATHODIC PROTECTION PANEL #2
STEADY BEARING
SHELL @ 12'-0" I.B.
STERN TUBE PRESSURE HEAD TANK
STERN TUBE L.O. PRESS CONTROL UNIT
STERN TUBE DR TK
SHELL @ 33'-0" LVL
FR 58
FR 50
FR 47
FR 44
FR 41
FR 38
FR 35
FR 32
FR 23
℄

PLAN VIEW BEL 33'-0" LVL

ITEM	DESCRIPTION	SOURCE OF MAT'L	FOUNDATION DWG NO	GROUP N
1	PORT BOILER	P.O.6800-C1	1020-65	6800-011
2	STBD BOILER	↓	↓ ↓	6800-011
3	REDUCTION GEAR	P.O.6100-C1	1060-73	6100-010
4	THRUST BEARING	↓		6100-010
5	MAIN CONDENSER	P.O.6250-C1		6250-010
6	L.P. TURBINE	P.O.6100-C1		6100-010
7	H.P. TURBINE	↓	↓ ↓	6100-010
8	ATMOSPHERIC CONDENSER	P.O.6250-C1	1220-2583 SH 51	6250-010
9	STEADY BEARING	P.O.6302-C1	1060-73	6302-010
(B) 10	DIESEL GEN L.O. TANK	M.O.6150-177 3.8 L.1	—	6150-0117
11	STERN TUBE DRAIN TK	P.O.6302-C2	1220-2590 SH 11	6302-010
12	BOILER WASHDOWN STRAINER TK	M.O.6150-177 3.6 L.1	SH 8	6150-010
13	AFT BILGE SUMP PUMP	P.O.6350-T16	↓ SH 7	6350-010
14	BILGE & BALLAST PMP #1	P.O.6350-T16	1220-2589 SH 9	6350-010
15	BILGE & BALLAST PMP #2	↓	1220-2590 SH 6	6350-010
16	BILGE & BALLAST PRIMING UNIT	P.O.6350-T9	1220-2589 SH 7	6350-010
17	DIESEL GEN S.W. PMP	P.O.6350-T7	1220-2583 SH 12	6350-010
18	L.O. HEATER	P.O.6402-C2	1220-2590 SH 5	6402-010
19	L.O. PURIFIER	P.O.6351-T3	SH 4	6351-010
20	DISTILLING PLANT FEED PMP #1	P.O.6350-T16	SH 9 & 10	6350-010
21	DISTILLING PLANT FEED PMP #2	P.O.6350-T16	↓ SH 9 & 10	6350-010
22	L.O. SUCTION STRAINER	P.O.6200-M4	1220-2589 SH 14	6200-010
23	L.O. DISCHARGE STRAINER	P.O.6200-M4	SH 15	6200-010
24	L.O. SERVICE PMP #1	P.O.6350-T8	SH 22	6350-010
25	L.O. SERVICE PMP #2	↓	SH 22	6350-010
26	MAIN L.O. COOLERS	P.O.6402-C1	SH 13	6402-105
27	S.W. SERVICE PMP #1	P.O.6350-T16	SH 10 & 11	6350-010
28	S.W. SERVICE PMP #2	↓	SH 10 & 11	6350-010
29	S.W. SCRUBBER PMP #2	P.O.6350-T16	↓ SH 23	6350-010
30	MN LIGHTING TRANSFORMERS	P.O.4100-C1	—	4100-011
31	MN CONDENSATE PMP #1	P.O.6350-T7	1220-2589 SH 6	6350-010
32	MN CONDENSATE PMP #2	↓	SH 6	6350-010
33	MN CIRC PMP #1	P.O.6350-T7	SH 4	6350-010
34	MN CIRC PMP #2	↓	SH 5	6350-010
35	F.O. TRANSFER PMP	P.O.6350-T8	SH 17	6350-010
36	BALLAST PMP TURBINE	P.O.6350-T3	SH 30	6350-010
37	CARGO OIL PMP TURBINE #1	P.O.6350-C4	SH 31	6350-010
38	CARGO OIL PMP TURBINE #2		SH 33	6350-010
39	CARGO OIL PMP TURBINE #3		SH 34	6350-010
40	CARGO OIL PMP TURBINE #4	↓	SH 32	6350-010
41	FIRE PUMP	P.O.6350-T13	SH 29	6350-010
42	EMERGENCY FIRE PUMP	P.O.6350-T7	↓ SH 26	6350-010
43	MAIN FEED PMP #1	P.O.6350-T6	1220-2602 SH 4	6350-010
44	MAIN FEED PMP #2	↓	SH 4	6350-010
45	F.O. PUMP #1	P.O.6350-T8	SH 6	6350-010
46	F.O. PUMP #2	↓	SH 6	6350-010
47	F.O. SUCTION STRAINER	P.O.6350-M7	SH 7	6350-010
48	F.O. HEATERS	P.O.6402-T5	↓ SH 5	6402-011
49	DIESEL OIL PMP	P.O.6350-T8	1220-2608 SH 8	6350-011
50	HYDRAULIC THROTTLE CONTROL ASSY	P.O.6100-C1	1220-2603 SH 8	6100-105
51	MN GLAND EXHAUST FAN	P.O.6351-M4	↓ SH 10	6351-011
52	CONDENSATE DE-OILER	P.O.6400-C4	—	6400-010
(B) 53	BILGE & BALLAST PRIMING TANK	P.O.6350-T9	—	6350-010
54	AIR EJECTOR	P.O.6351-T1	1220-2603 SH 9	6351-010
55	CONTAMINATED ST GEN	P.O.6402-C2	—	6402-010
(B) 56	STERN TUBE L.O. PRESS. CONTROL UNIT	P.O.6302-C2	1220-2590 SH 16	6302-106
57	THROTTLE CONTROL BOARD	N.N. DWG 6755-53	N.N. DWG 6755-53	N.N. D 6755-
58	SLOP TK DR CNDS COOLER	P.O.6402-C2	1220-2603 SH 16	6402-010
59	CONTROL AIR COMP MODULE	P.O.6351-C5	↓ SH 6	6351-010
60	CONTROL AIR RECEIVER	P.O.6351-C5	—	6351-010
61	CONTROL AIR REFRIGFILTER #1	P.O.6351-C5	1220-2603 SH 11	6351-010
(E) 62	CLEAN RAG LOCKER	NN DWG 6150-175	—	
63	SEWAGE TREATMENT PLANT	P.O.2504-C1	—	2504-010
64	1ST & 2ND STG FEED HTR	P.O.6400-T1	1220-2607 SH 3	6400-011
(E) 65	OILY RAG LOCKER	N.N. DWG 6150-175	—	
66	BOILER WTR TEST CABINET	P.O.6557-C1	—	6557-011
67	4TH & 5TH STG FEED HTR	P.O.6400-T1	1220-2607 SH 6	6400-011
68	DISTILLING PLANT #1	P.O.6400-C1	—	6401-011
69	DISTILLING PLANT #2	P.O.6401-C1	—	6401-011
70	POTABLE WTR PMP #1	P.O.6350-T16	1220-2608 SH 8	6350-011
71	POTABLE WTR PMP #2	↓	↓ SH 8	6350-011

ARRANGEMENT OF MACHINERY
IN ENGINE ROOM-PLANS

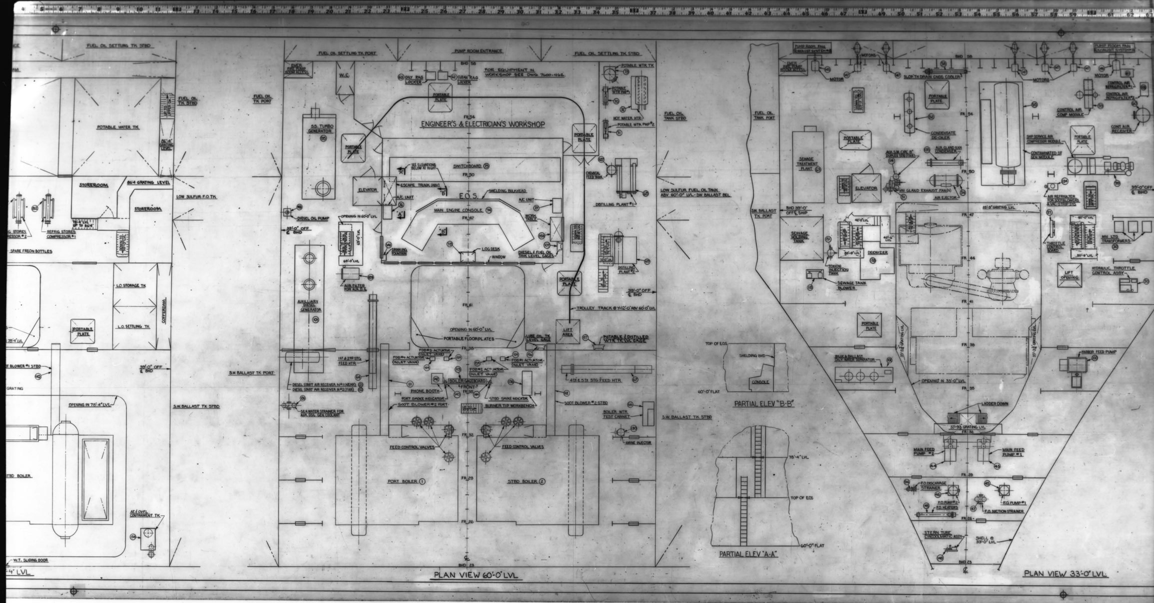
~ PREPARED BY ~

NEWPORT NEWS SHIPBUILDING

HULL NO. 613C | DRAWING NO. 257703

257703

SEPT. '80
10X
FRAME 2


FUEL OIL SETTLING TK STBD
FUEL OIL TK STBD
FUEL OIL TK PORT
POTABLE WATER TK
STOREROOM
STOREROOM
86'-4" GRATING LEVEL
LOW SULFUR F.O. TK
REFRIG STORES COMPRESSOR #2
REFRIG STORES COMPRESSOR #1
SPARE FREON BOTTLES
L.O. STORAGE TK
L.O. SETTLING TK
COFFERDAM
PORTABLE PLATE
78'-4" LVL
BLOWER #1 STBD
GRATING
OPENING IN 78'-4" LVL
39'-0" OFF ℄ BHD
STBD BOILER
AE & OVFL CONTAINMENT TK
W.T. SLIDING DOOR
-4" LVL
S.W. BALLAST TK STBD
S.W. BALLAST TK PORT
FUEL OIL SETTLING TK PORT
PUMP ROOM ENTRANCE
FUEL OIL SETTLING TK STBD
BHD 58
EMER FIRE PUMP ROOM ACCESS
W.C.
OILY RAG LOCKER
CLEAN RAG LOCKER
FOR EQUIPMENT IN WORKSHOP SEE DWG. 7600-462
PORTABLE PLATE
FR 54
ENGINEER'S & ELECTRICIAN'S WORKSHOP
S.S. TURBO GENERATOR
POTABLE WTR TK
POTABLE WTR PMP
HOT WATER HTR
POTABLE WTR PMP #2
SEE ELEVATIONS BELOW AT RIGHT
SWITCHBOARD
FR 50
ELEVATOR
ESCAPE TRUNK (ABV)
SHIELDING BULKHEAD
E.O.S.
A/C UNIT
A/C UNIT
MAIN ENGINE CONSOLE
FR 47
WORK TABLE
CHEMICAL FEED TANK
DISTILLING PLANT #1
DIESEL OIL PUMP
OPENING IN 60'-0" LVL
39'-0" OFF ℄ BHD
60'-0" LVL
DRINKING FOUNTAIN
LOG DESK
WINDOW
DIESEL & FUEL OIL TANK LEVEL GAGES
DISTILLING PLANT #2
AIR FILTER FOR AUX. D.G.
FR 41
39'-0" OFF ℄ BHD
TROLLEY TRACK @ Y=12'-0" ABV 60'-0" LVL
AUXILIARY DIESEL GENERATOR
OPENING IN 60'-0" LVL
PORTABLE FLOORPLATES
LUBE OIL TK LEVEL GAGE
LIFT AREA
POTABLE & DISTILLED WTR TK LVL GAGE
FR 38
1ST & 2ND STG FEED HTR
FDB #4 ACTUATOR (INLET VANE)
FDB #3 ACTUATOR (INLET VANE)
FDB #2 ACTUATOR (INLET VANE)
FDB #1 ACTUATOR (INLET VANE)
4TH & 5TH STG FEED HTR
DIESEL START AIR RECEIVER No 1 (NEAR)
DIESEL START AIR RECEIVER No 2 (FAR)
PHONE BOOTH
BOILER GAGEBOARD
FRONT
FR 35
PORT SMOKE INDICATOR
STBD SMOKE INDICATOR
SOOT BLOWER #2 PORT
SOOT BLOWER #2 STBD
BURNER TIP WORKBENCH
BOILER WTR TEST CABINET
SEA WATER STRAINER FOR AUX. DSL. GEN COOLANT
AMINE INJECTOR
FR 32
FEED CONTROL VALVES
FEED CONTROL VALVES
FR 29
PORT BOILER ①
STBD BOILER ②
FR 26
℄
BHD 23
PLAN VIEW 60'-0" LVL
FUEL OIL TANK STBD
LOW SULFUR FUEL OIL TANK ABV 60'-0" LVL - DW BALLAST BEL
FUEL OIL TANK PORT
S.W. BALLAST TK PORT
S.W. BALLAST TK STBD
TOP OF E.O.S.
SHIELDING BHD
CONSOLE
60'-0" FLAT
PARTIAL ELEV "B-B"
78'-4" LVL
TOP OF E.O.S.
60'-0" FLAT
PARTIAL ELEV "A-A"
PUMP ROOM FAN EXHAUST SYSTEM #1
EMER FIRE PUMP ROOM ACCESS
MOTOR
MOTORS
BHD 58
SLOP TK DRAIN CNDS COOLER
MOTORS
PUMP ROOM FAN EXHAUST SYSTEM #2
MOTOR
CONTROL AIR REFRIGERATOR #1
CONTROL AIR REFRIGERATOR #2
PORTABLE PLATE
FR 54
CONDENSATE DE-OILER
CONTROL AIR COMP MODULE
CONT AIR RECEIVER
PORTABLE PLATE
SEWAGE TREATMENT PLANT
AUX S.W. CIRC & DUPLEX STRAINER
AUX GLAND EXH CONDENSER
SHIP SERVICE AIR COMPRESSOR MODULE
PORTABLE PLATE
CONTAMINATED ST GEN MODULE
ELEVATOR
AUX GLAND EXHAUST FAN
AIR EJECTOR
FR 50
AIR REFRIGERATOR FOR SOOTBLOWERS & VAC STRIP SYS
39'-0" OFF ℄ BHD
BHD 39'-0" OFF SHIP
33'-3" GRATING LVL
FR 47
SEWAGE HOLDING TANK
42'-0" LVL
40'-6" LVL
50'-0" LVL
DEIONIZER
THROTTLE CONTROL BOARD
MN LTG TRANSFORMERS
50'-0" LVL
TOXION INJECTION TANK
SEWAGE TANK BLOWER
FR 44
LIFT OPENING
HYDRAULIC THROTTLE CONTROL ASSY
FR 41
PORTABLE PLATE
33'-3" GRATING LVL
33'-3" GRATING LVL
FR 38
BILGE & BALLAST OILY WATER SEPARATOR
HARBOR FEED PUMP
OPENING IN 33'-0" LVL
FR 35
LADDER DOWN
33'-3" GRATING LVL
FR 32
MAIN FEED PUMP #2
MAIN FEED PUMP #1
FR 29
F.O. DISCHARGE STRAINER
F.O. PUMP #2
F.O. HEATERS
F.O. PUMP #1
F.O. SUCTION STRAINER
FR 26
STERN TUBE CIRCOLMATIC ASSY
SHELL @ 33'-0" LVL
BHD 23
℄
PLAN VIEW 33'-0" LVL

257703

MICRO-MASTER 105 mm

K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

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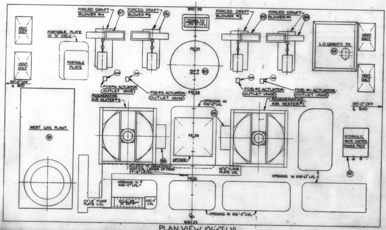
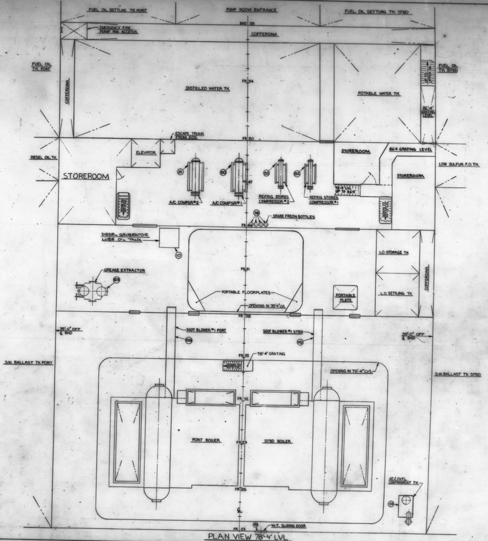
10X

FRAME 3


VENT DUCT
VENT DUCT
PORTABLE PLATE IN "D" DECK
PORTABLE PLATE
FORCED DRAFT BLOWER #4
87
FORCED DRAFT BLOWER #3
86
BHD 38
DOWN TO 96'-3" LVL
FORCED DRAFT BLOWER #2
85
FORCED DRAFT BLOWER #1
84
L.O. GRAVITY TK
93
VENT DUCT
VENT DUCT
FR 35
DFT
90
160
FDB #4 ACTUATOR (OUTLET VANE)
FDB #3 ACTUATOR (OUTLET VANE)
FR 32
FDB #2 ACTUATOR (OUTLET VANE)
FDB #1 ACTUATOR (OUTLET VANE)
39'-0" OFF ℄ BHD
REGENERATIVE AIR HEATER #2
REGENERATIVE AIR HEATER #1
OPENING IN 106'-0" LVL
88
FR 29
INERT GAS PLANT
91
HYDRAULIC VALVE CONTROL POWER PACK
92
UPTAKE
89
ACCESS TO SMOKESTACK VERTICAL LADDER UP FROM 117'-6" LEVEL
117'-6" FLOOR PLATE LVL
FR 26
OPENING IN 106'-0" LVL
117'-6" FLOOR PLATE LVL
117'-6" DN TO 106'-0"
106'-0" LVL
OPENING IN 106'-0" LVL
℄
BHD 23

PLAN VIEW 106'-0" LVL


FUEL OIL SETTLING TK PORT
PUMP ROOM ENTRANCE
FUEL OIL SETTLING TK STBD
BHD 58
EMERGENCY FIRE PUMP RM ACCESS
COFFERDAM
FUEL OIL TK PORT
COFFERDAM
FR 54
DISTILLED WATER TK
POTABLE WATER TK
UP TO UPPER DK
86'-4" GRATING LEVEL
FUEL OIL TK STBD
ESCAPE TRUNK FROM EOS
FR 50
DIESEL OIL TK
ELEVATOR
STOREROOM
86'-4 GRATING LEVEL
LOW SULFUR F.O. TK
STOREROOM
81
80
83
82
FR 47
STOREROOM
78'-4" LVL UP TO 86'-4"
A/C COMPSR #2
A/C COMPSR #1
REFRIG STORES COMPRESSOR #2
REFRIG STORES COMPRESSOR #1
DOWN TO 70'-0" LVL
116
SPARE FREON BOTTLES
FR 44
DIESEL GENERATOR LUBE OIL TANK
10
FR 41
L.O. STORAGE TK
GREASE EXTRACTOR
128
PORTABLE FLOORPLATES
PORTABLE PLATE
L.O. SETTLING TK
COFFERDAM
OPENING IN 78'-4" LVL
FR 38
39'-0" OFF ℄ BHD
SOOT BLOWER #1 PORT
109
SOOT BLOWER #1 STBD
110
39'-0" OFF ℄ BHD
S.W. BALLAST TK PORT
FR 35
78'-4" GRATING
DOWN TO 70'-0" LVL
OPENING IN 78'-4" LVL
S.W. BALLAST TK STBD
FR 32
PORT BOILER
FR 29
STBD BOILER
FR 26
AE & OVFL CONTAINMENT TK
154
℄
FR 23
132
W.T. SLIDING DOOR

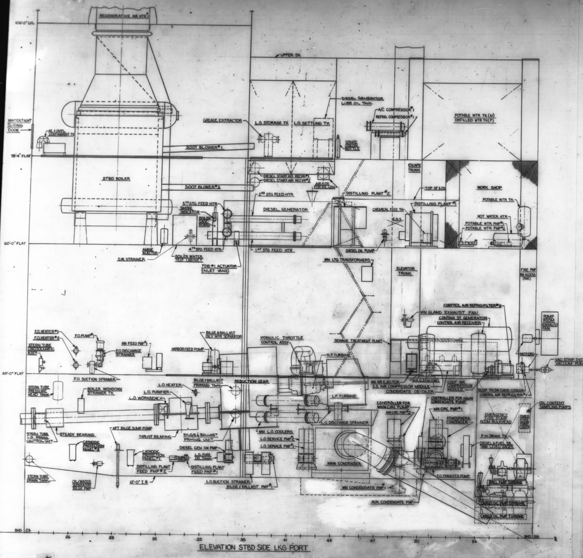
PLAN VIEW 78'-4" LVL

FUEL OIL TK PORT
S.W. BALLAST TK PORT

257703

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.

SEPT. '80
10X
FRAME 4


106'-0" LVL
REGENERATIVE AIR HTR #1
UPPER DK
WATERTIGHT SLIDING DOOR
AE & OVFL CONTAINMENT TK
78'-4" FLAT
GREASE EXTRACTOR
L.O. STORAGE TK
L.O. SETTLING TK
DIESEL GENERATOR LUBE OIL TANK
SPARE FREON BOTTLE
A/C COMPRESSOR #1
REFRIG. COMPRESSOR #1
POTABLE WTR TK (N)
DISTILLED WTR TK (P)
SOOT BLOWER #1
STBD BOILER
SOOT BLOWER #2
DIESEL START AIR RECVR #1
DIESEL START AIR RECVR #2
AIR FLTR FOR DSL GEN
ESCAPE TRUNK
TOP OF EOS
WORK SHOP
2ND STG FEED HTR
5TH STG FEED HTR
SMOKE INDICATOR
BOILER GAGE BOARD
DIESEL GENERATOR
DISTILLING PLANT #2
CHEMICAL FEED TK
E.O.S.
DISTILLING PLANT #1
POTABLE WTR TK
HOT WATER HTR
POTABLE WTR PMP #1
POTABLE WTR PMP #2
60'-0" FLAT
AMINE INJECTOR
S.W. STRAINER
BOILER WATER TEST CABINET
4TH STG FEED HTR
1ST STG FEED HTR
FDB #1 ACTUATOR (INLET VANE)
DIESEL OIL PUMP
MN LTG TRANSFORMERS
ELEVATOR TRUNK
FIRE PMP RM ACCESS (FAR)
CONTROL AIR REFRIG/FILTER #2
MN GLAND EXHAUST FAN
CONTAM ST GENERATOR
CONTROL AIR RECEIVER
PUMP ROOM EXHAUST FAN
F.O. HEATER #1
F.O. HEATER #2
F.O. PUMP #1
STERN TUBE CIRCOOLMATIC ASSY
F.O. DISCHARGE STRAINER
MN FEED PMP #1
HARBOR FEED PUMP
BILGE & BALLAST OILY WTR SEPARATOR
HYDRAULIC THROTTLE CONTROL ASSY
SEWAGE TREATMENT PLANT
H.P. TURBINE
MOTORS
VAC-STRIP SYSTEM VACUUM PUMP
33'-0" FLAT
F.O. SUCTION STRAINER
STERN TUBE PRESSURE HEAD TANK
BOILER WASHDOWN STRAINER TK
L.O. HEATER
BILGE & BALLAST PRIMING TANK
REDUCTION GEAR
L.O. PURIFIER
L.O. WORKBENCH
MN AIR EJECTOR
AUX GLD EXH COND
S.S. AIR COMPRESSOR MODULE
CONDENSATE DE-OILER
CONT AIR COMPRESSOR MODULE
SLOP TK DR CNDS COOLER
CONTROL AIR REFRIG/FILTER #1
L.P. TURBINE
CONTROLLER FOR MAIN CIRC PUMP
MN CIRC PMP #2
CONTROLLER FOR MAIN CONDENSATE PUMP
MN CIRC PMP #1
ATMOSPHERIC CONDENSER
EMERGENCY FIRE PUMP ROOM BULKHEAD
EMER FIRE PUMP CONTR
OIL CONTENT SAMPLING PUMPS
STERN TUBE L.O. PRESS. CONTROL UNIT
STEADY BEARING
AFT BILGE SUMP PUMP
THRUST BEARING
BILGE & BALLAST PRIMING UNIT
L.O. DISCHARGE STRAINER
MN L.O. COOLERS
L.O. SERVICE PMP #2
L.O. SERVICE PMP #1
CATHODIC PROTECTION PANEL #2
CATHODIC PROTECTION PANEL #1
DIESEL GEN SW. PMP
L.O. PURE DR. TANK
MAIN CONDENSER
F.W. DRAIN TK
DIESEL & FUEL OIL TANK LEVEL GAGES
DISTILLING PLANT FEED PMP #2
DISTILLING PLANT FEED PMP #1
STERN TUBE DRAIN TANK
OIL/WATER SEPARATOR BILGE PMP
12'-0" I.B.
L.O. SUCTION STRAINER
BILGE & BALLAST PMP #1
F.O. TRANSFER PUMP
BALL PMP TURBINE
MN CONDENSATE PMP #1
AUX CONDENSATE PMP
CARGO OIL PMP TURBINE
CARGO OIL PMP TURBINE
BHD 23
26
29
32
35
38
41
44
47
50
54
BHD 58
℄

ELEVATION STBD SIDE LKG PORT

1

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH	OWNER DATE	OWNER APPD
A	–	INITIAL ISSUE	6/9/76	JHJ	–	–
B	–	DRAWING REVISED AS DESCRIBED IN REV "B" ON PLAN VIEW.	1/11/77	JHJ	–	–
C		ADDED AE & OVFL CONTAINMENT TK	12/6/77	JHJ	–	–
D.		ADDED FDB ACTUATORS ADDED AUX L.O. PUMP.	1/15/79	JHJ	–	–

AUTHORITY:

GENERAL NOTES:

FOR PLAN VIEW SEE DWG № 257703

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C 613C	310 309	

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

SCALE 1/4" = 1 FT
DRAWN E.R. SMOOT
CHECKED JHJ
SECT MGR J.H. Johnson
DATE COMPL. 6-9-76
EXAMINED —
AUTHORIZED E.E. Stephenson
DATE 6-9-76
TECH APPROVAL NOT REQ'D
CSD APPROVAL R. L. Harrington

ARRANGEMENT OF MACHINERY
ENG ROOM - ELEV & SECT

USMA DESIGN T11-S-1164
USMA DWG NO.
HULL NO.
DWG NO. 257704
REV D
SHEET NO. 1 OF 1

NO.	REFERENCES	DWG NO.

DWG. REV — HULL APPLIC

REV	NN HULLS ONLY					
	613	614				
A	YES	YES				
B	YES	YES				
C	YES	YES				
D	YES	YES				

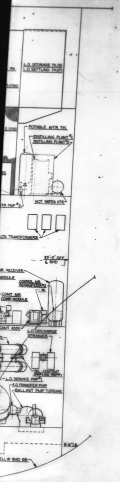
REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 1-15-9 SIGNED J.H. Johnson

YARD PRINTS
ORDERED BY DESIGN
GROUP:
MC NO.

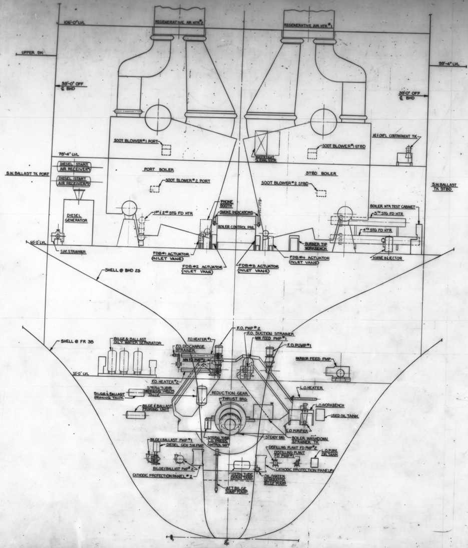
D
C
B
A

257704

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 1

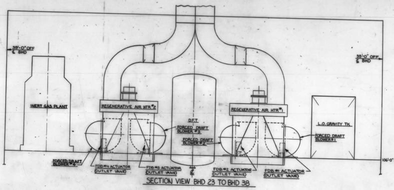


L.O. STORAGE TK (N)
L.O. SETTLING TK (F)
POTABLE WTR TK
DISTILLING PLANT #1
DISTILLING PLANT #2
HOT WATER HTR
LTG TRANSFORMERS
39'-0" OFF ℄ BHD
CONTROL AIR REFRIGERATOR #2
CONT AIR COMP MODULE
L.O. DISCHARGE STRAINER
OIL CONTENT SAMPLING PMP #1
L.O. SERVICE PMP #1
F.O. TRANSFER PMP
BALLAST PMP TURBINE
8'-6" I.B.
SHELL @ BHD 58



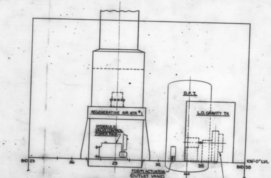
REGENERATIVE AIR HTR #2
REGENERATIVE AIR HTR #1
106'-0" LVL
UPPER DK
39'-4" LVL
39'-0" OFF ℄ BHD
39'-0" OFF ℄ BHD
SOOT BLOWER #1 PORT
SOOT BLOWER #1 STBD
AE-1 OVFL CONTAINMENT TK
WATERTIGHT SLIDING DOOR
78'-4" LVL
DIESEL START AIR RECEIVER #1
DIESEL START AIR RECEIVER #2
PORT BOILER
STBD BOILER
S.W. BALLAST TK PORT
S.W. BALLAST TK STBD
SOOT BLOWER #2 PORT
SOOT BLOWER #2 STBD
DIESEL GENERATOR
PHONE BOOTH
SMOKE INDICATORS
1ST & 2ND STG FD HTR
BOILER CONTROL PNL
BOILER HTR TEST CABINET
5TH STG FD HTR
4TH STG FD HTR
BURNER TIP WORKBENCH
60'-0" LVL
S.W. STRAINER
FDB #1 ACTUATOR (INLET VANE)
FDB #2 ACTUATOR (INLET VANE)
FDB #3 ACTUATOR (INLET VANE)
FDB #4 ACTUATOR (INLET VANE)
AMINE INJECTOR
SHELL @ BHD 23
SHELL @ FR 38
BILGE & BALLAST OILY WATER SEPARATOR
F.O. HEATER #1
F.O. PMP #2
F.O. SUCTION STRAINER
MN FEED PMP #1
F.O. PUMP #1
F.O. DISCHARGE STRAINER
MN FD PMP #2
HARBOR FEED PMP
33'-0" LVL
F.O. HEATER #2
REDUCTION GEAR
L.O. HEATER
BILGE & BALLAST PRIMING TANK
STERN TUBE PRESSURE HEAD TANK
THRUST BRG
L.O. WORKBENCH
BILGE & BALLAST PRIMING UNIT
USED OIL TANK
L.O. PURIFIER
STEADY BRG
BOILER WASHDOWN STRAINER TK
STERN TUBE L.O. PRESS. CONTROL UNIT
BILGE & BALLAST PMP #1
DIESEL GEN S.W. PMP
DISTILLING PLANT FD PMP #2
DISTILLING PLANT FD PMP #1
L.O. PURE OIL TANK
BILGE & BALLAST PMP #2
CATHODIC PROTECTION PANEL #1
CATHODIC PROTECTION PANEL #2
STERN TUBE DRAIN TANK
OIL/WATER SEPARATOR BILGE PUMP
AFT BILGE SUMP PUMP
℄

SECTION VIEW BHD 23 TO FR 38



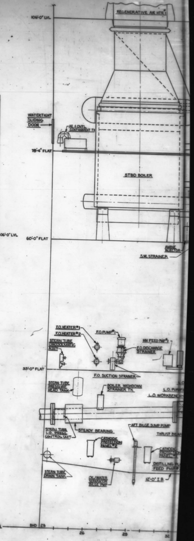
39'-0" OFF ℄ BHD
39'-0" OFF ℄ BHD
INERT GAS PLANT
REGENERATIVE AIR HTR #2
REGENERATIVE AIR HTR #1
D.F.T.
FORCED DRAFT BLOWER #3
FORCED DRAFT BLOWER #2
L.O. GRAVITY TK
FORCED DRAFT BLOWER #1
FORCED DRAFT BLOWER #4
FDB #4 ACTUATOR (OUTLET VANE)
FDB #3 ACTUATOR (OUTLET VANE)
FDB #2 ACTUATOR (OUTLET VANE)
FDB #1 ACTUATOR (OUTLET VANE)
106'-0" LVL
℄

SECTION VIEW BHD 23 TO BHD 38



D.F.T.
REGENERATIVE AIR HTR #1
HYDRAULIC VALVE CONTROL POWER PACK
L.O. GRAVITY TK
BHD 23
26
29
32
35
BHD 38
106'-0" LVL
FDB #1 ACTUATOR (OUTLET VANE)
FORCED DRAFT BLOWER

ELEVATION STBD SIDE LKG PORT



REGENERATIVE AIR HTR
106'-0" LVL
WATERTIGHT SLIDING DOOR
AE-1 OVFL CONTAINMENT TK
78'-4" FLAT
STBD BOILER
60'-0" FLAT
AMINE INJECTOR
S.W. STRAINER
F.O. HEATER #1
F.O. HEATER #2
F.O. PMP #1
MN FEED PMP #1
STERN TUBE PNEUMATIC ASSY
F.O. DISCHARGE STRAINER
33'-0" FLAT
F.O. SUCTION STRAINER
STERN TUBE PRESSURE HEAD TANK
BOILER WASHDOWN STRAINER TK
L.O. PURIFIER
L.O. WORKBENCH
STEADY BEARING
AFT BILGE SUMP PUMP
THRUST BEARING
STERN TUBE L.O. PRESS. CONTROL UNIT
CATHODIC PROTECTION PANEL #2
CATHODIC PROTECTION PANEL
DISTILLING PLANT FEED PMP
STERN TUBE DRAIN TANK
OIL/WATER SEPARATOR BILGE PMP
12'-0" I.B.
BHD 23
26
29

257704

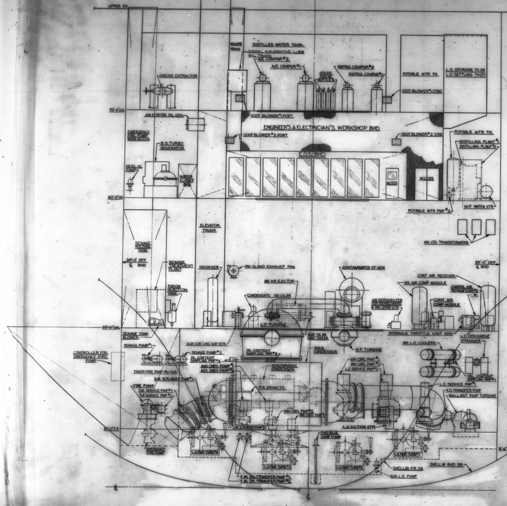
MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

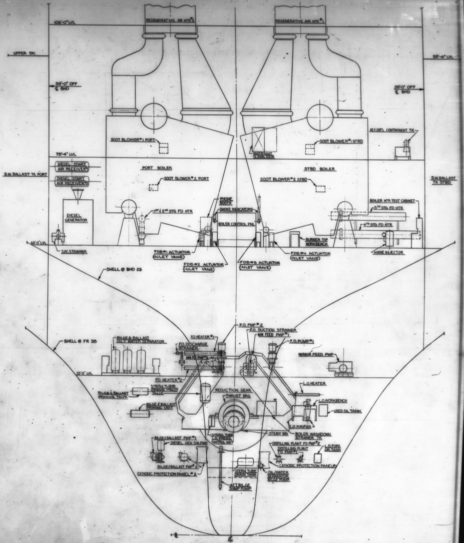
10X

FRAME 2


UPPER DK
ESCAPE TRUNK
DISTILLED WATER TANK
DIESEL GENERATOR LUBE OIL TANK
A/C COMPSR #2
A/C COMPSR #1
SPARE FREON BOTTLES
REFRIG COMPSR #2
REFRIG COMPSR #1
POTABLE WTR TK
L.O. STORAGE TK (N)
L.O. SETTLING TK (F)
GREASE EXTRACTOR
SOOT BLOWER #1 STBD
78'-4" LVL
AIR FLTR FOR DSL GEN
SOOT BLOWER #1 PORT
ENGINEER'S & ELECTRICIAN'S WORKSHOP BHD
EMERGENCY FIRE PUMP ROOM ACCESS
SOOT BLOWER #2 PORT
SOOT BLOWER #2 STBD
POTABLE WTR TK
DISTILLING PLANT #1
DISTILLING PLANT #2
S.S. TURBO GENERATOR
E.O.S. BHD
DIESEL OIL PUMP
WATER CLOSET BHD
ACCESS
ACCESS
60'-0" LVL
POTABLE WTR PMP #2
HOT WATER HTR
ELEVATOR TRUNK
MN LTG TRANSFORMERS
SEWAGE HOLDING TANK
39'-0" OFF ℄ BHD
SEWAGE TREATMENT PLANT
DEIONIZER
MN GLAND EXHAUST FAN
CONTAMINATED ST GEN
39'-0" OFF ℄ BHD
CONT AIR RECEIVER
MN AIR EJECTOR
SS AIR COMP MODULE
CONTROL AIR REFRIG/FILTER #2
#1
TOXION INJECTION TANK
CONDENSATE DE-OILER
AIR REFRIG/FILTER FOR SOOTBLOWERS & VAC STRIP SYS
CONT AIR COMP MODULE
L.P. TURBINE
33'-0" LVL
HYDRAULIC THROTTLE CONT ASSY
SEWAGE TANK BLOWER
AUX S.W. CIRC DUP STR
SLOP TK DR CNDS COOLER
L.O. DISCHARGE STRAINER
H.P. TURBINE
MN L.O. COOLERS
SEWAGE PUMP #1
CONTROLLER FOR EMERGENCY FIRE PUMP
SEWAGE PUMP #2
OIL CONTENT SAMPLING PMP #3
OIL CONTENT SAMPLING PMP #2
MAIN CONDENSER
MN CIRC PMP #1
MN CIRC PMP #2
L.O SERVICE PMP #2
AUX CNDS PUMP #1
AUX CNDS PUMP #2
ATMOSPHERIC CONDENSER
EMER FIRE PMP RM BHD
OIL CONTENT SAMPLING PMP #1
S.W. SCRUBBER PMP #1
F.W. DRAIN TK
L.O. SERVICE PMP #1
FIRE PUMP
S.W. SERVICE PMP #1
S.W. SERVICE PMP #2
F.O TRANSFER PMP
BALLAST PMP TURBINE
MN CNDS PMP #2
MN CNDS PMP #1
L.O. SUCTION STR
12'-0" I.B.
S.W. SCRUBBER PMP #2
FWD BILGE SUMP PUMP
EMERGENCY FIRE PUMP
C.O. PMP TURB #4
C.O. PMP TURB #3
C.O. PMP TURB #2
C.O. PMP TURB #1
8'-6" I.B.
SHELL @ FR 38
SHELL @ BHD 58
AUX L.O. PUMP
F.W. DR. TRANSFER PMP #1
F.W. DR. TRANSFER PMP #2
℄
℄

SECTION VIEW FR 38 TO BHD 58

LKG FWD


REGENERATIVE AIR HTR #2
REGENERATIVE AIR HTR #1
106'-0" LVL
UPPER DK
99'-4" LVL
39'-0" OFF ℄ BHD
39'-0" OFF ℄ BHD
AE & OVFL CONTAINMENT TK
SOOT BLOWER #1 PORT
SOOT BLOWER #1 STBD
WATERTIGHT SLIDING DOOR
78'-4" LVL
DIESEL START AIR RECEIVER #1
DIESEL START AIR RECEIVER #2
PORT BOILER
STBD BOILER
S.W. BALLAST TK PORT
S.W. BALLAST TK STBD
SOOT BLOWER #2 PORT
SOOT BLOWER #2 STBD
PHONE BOOTH
SMOKE INDICATORS
BOILER WTR TEST CABINET
5TH STG FD HTR
DIESEL GENERATOR
1ST & 2ND STG FD HTR
BOILER CONTROL PNL
4TH STG FD HTR
BURNER TIP WORKBENCH
60'-0" LVL
S.W. STRAINER
FDB #1 ACTUATOR (INLET VANE)
FDB #2 ACTUATOR (INLET VANE)
FDB #3 ACTUATOR (INLET VANE)
FDB #4 ACTUATOR (INLET VANE)
AMINE INJECTOR
SHELL @ BHD 23
F.O. PMP #2
F.O. SUCTION STRAINER
MN FEED PMP #1
F.O. HEATER #1
F.O. PUMP #1
BILGE & BALLAST OILY WATER SEPARATOR
SHELL @ FR 38
F.O. DISCHARGE STRAINER
MN FD PMP #2
HARBOR FEED PMP
33'-0" LVL
F.O. HEATER #2
L.O. HEATER
STERN TUBE PRESS HEAD TANK
REDUCTION GEAR
BILGE & BALLAST PRIMING TANK
THRUST BRG
L.O. WORKBENCH
BILGE & BALLAST PRIMING UNIT
USED OIL TANK
L.O. PURIFIER
STERN TUBE L.O. PRESS CONTROL UNIT
STEADY BRG
BOILER WASHDOWN STRAINER TK
BILGE & BALLAST PMP #1
DIESEL GEN S.W. PMP
DISTILLING PLANT FD PMP #2
DISTILLING PLANT FD PMP #1
L.O. PURE DR TANK
BILGE & BALLAST PMP #2
CATHODIC PROTECTION PANEL #1
CATHODIC PROTECTION PANEL #2
STERN TUBE DRAIN TANK
OIL/WATER SEPARATOR BILGE PUMP
AFT BILGE SUMP PUMP
℄
℄

SECTION VIEW BHD 23 TO FR 38

257704

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 3

257706 CSD VAULT

E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS PARTIAL ISSUE FOR REV 'H'
GROUPING YES
DATE 3-27-79
SIGNED L.W. Croswell

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS																											
REV.	G	G	B	D	D	A	C	A	A	A	A	C	C	D	D	B	B	B	B	B	B	B	B	B	B	D
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	2A	25
REV.	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	G	E	F								
SHEET	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43								

GROUP SEE GROUP SHTS
MC NO.

NNS&DDCo. HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C	310	↑	
613C	309	T11-S-116A	

DWG. REV. — HULL APPLIC.

REV.	613C	614C
A	YES	YES
B	YES	YES
C	YES	YES
D	YES	YES
E	YES	YES
F	YES	YES
G	YES	YES
H	NO	YES

APPROVALS
OWNERS NOT REQ'D
ABS NOT REQ'D
USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING DEPT

SCALE NTS = 1 Ft.
DRAWN L.J. FLOWERS
CHECKED E.W. KELLY
SECT. MGR. L.W. Croswell
DATE COMPL. 6-11-76
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 6-11-76
TECH. APPROVAL NOT REQ'D
CSD APPROVAL R.L. Harrington
HULL 613C
TITLE LIST OF MACHY OUTSIDE MCHRY SPACE
TYPE OF DWG. WORKING DRAWING
DWG. NO. 257706 REV H SHEET NO. 1 OF 24
1008

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D	OWNER DATE	OWNER APPD.
A	–	INITIAL ISSUE	☒	☒	☒	☒
B	1	CORRECTED TITLE TO SUIT PLAN SCHEDULE				
	2A	ADDED REFERENCES 7 THRU 23				
	3	ADDED NOTES 1 & 2				
	16-24	ADDED GROUPS 2015-0405-1001 SI, 2015-2301-1001 SI, 2015-1806-1001 SI, 2015-1804-1001 SI, & 2015-0404-1001 SI. CBD 2-7-77	2/10/77	LWC		
C	5 7 12 13	GROUP NO. WAS 2600-0110-1003 PI GROUP NO. WAS 2280-0110-1003 PI GROUP NO. WAS 6350-0110-1004 PI GROUP NO. WAS 6350-0110-1005 PI KSN	12/7/77	LWC		
D	25 THRU 40 14 15 4 5 14	ADDED GROUP NO. WAS 2280-1901-1006 GROUP NO. WAS 2600-1901-1005 LINES 1 & 8 MAT'L SOURCE WAS 6350-T2 LINE 5 MAT'L SOURCE WAS 6350-T2 LINE 1 MAT'L SOURCE WAS 6350-T2 KSN	3/29/78	LWC		
E	41 42 43	ADDED ↓ AES	6/8/78	LWC		
F	41 43	LINE 3 ADDED. LINE 2 QTY. WAS 2. LINES 4 & 6 F-4 WAS F-8 RS 168	9/18/78	LWC		
G	41	LINE 3 WAS 15.2 METER JWS	12/26/78	LWC		
H	30	LINE 1 WAS QUAD & DUAL REMOTE CONT. STATION ADDED LINE 4. WHF	3/27/79	LWC		

REFERENCES CONT'D ON SHEET 2A

NO.	REFERENCES	DWG. NO.
6	ARR-CARGO OIL & SEGREGATED BALLAST SYSTEM IN CARGO PUMP RM-L/M	2600-81
5	ARR-CARGO OIL & SEGREGATED BALLAST SYSTEN IN CARGO PUMP RM-ELEV	2600-78
4	ARR-CARGO OIL & SEGREGATED BALLAST SYSTEM IN CARGO PUMP RM-SECT	2600-80
3	ARR-CARGO OIL & SEGREGATED BALLAST SYSTEM IN CARGO PUMP RM.-PLAN & SECT	2600-79
2	DIAG CARGO OIL AND SEGREGATED BALLAST SYSTEM-LIST	2600-102
1	DIAG CARGO OIL AND SEGREGATED BALLAST SYSTEM-ARR	2600-101

HULL NO. 613C-614C DWG. NO. 257706 REV H SHEET 2 OF —

NO.	REFERENCES	DWG. NO.
23	STORAGE REEL, F.A.E., & FAIRLEADER ARR	LEBUS DWG 22-001-020
22	OUTLINE MOORING WINCH-(DOUBLE DRUM W/GYPSY TO LEFT)	LEBUS DWG 18-101-001
21	OUTLINE MOORING WINCH-(DOUBLE DRUM W/GYPSY TO RIGHT)	LEBUS DWG 18-102-001
20	OUTLINE MOORING WINCH-(SINGLE DRUM W/ GYPSY)	LEBUS DWG 18-001-001
19	OUTLINE MOORING WINCH-(SINGLE DRUM NO GYPSY)	LEBUS DWG 18-003-001
18	COMBINATION F.L.A.-MOORING WINCH 35 M.TON	LEBUS DWG 22-001-001
17	MOORING DETAILS	1203-52
16	UPPER DK PLTG & FRAMING FWD FR 124~INBD 38'-9 OFF ℄	1160-46
15	UPPER DK PLTG & FRAMING FR 61¼-110~INBD 62'-6 OFF ℄	1160-43
14	UPPER DK PLTG & FRAMING AFT FR 23½(S)	1160-45
13	UPPER DK PLTG & FRAMING AFT FR 23½(P)	1160-40
12	MOORING INSTALLATION ARRANGEMENT	1203-51
11	"CHOCK-FAST" INSTALLATION PROCEDURE	letter
10	FDN MOORING WINCHES UPPER DK FWD FR 110	1220-2693
9	FDN MOORING WINCHES UPPER DK FR 23½-110	1220-2694
8	FDN~ MOORING WINCHES UPPER DK AFT FR 23½	1220-2695
7	M.O. FOR LINERS, CHOCKS, & KEYS FOR WINCHES	2015-37

HULL NO. 613C, 614C DWG. NO 257706 REV B SHEET 2A OF —

NOTES

(B) 1. EXCEPT FOR THE NARROW SIDE STAND FOUNDATION WHICH SUPPORTS THE END OF THE WINCH DRUM OPPOSITE THE REDUCTION GEARS (SEE NOTE 4), ALL EQUIPMENT, ITEMS 1 THRU 15, SHALL BE INSTALLED USING "CHOCK-FAST" LINER MATERIAL (½" NOM. THK) IN ACCORDANCE WITH REFERENCE 11.

(B) 2. THE NARROW SIDE STAND FOUNDATION WHICH SUPPORTS THE END OF THE WINCH DRUM OPPOSITE THE REDUCTION GEAR SHALL BE INSTALLED USING STEEL LINERS, ITEM 16.

HULL NO. 613C, 614C DWG. NO. 257706 REV B SHEET 3 OF —

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D	1	1	1	F-205	C.O. SEPERATOR TK & STRAINER NO. 1	P.O. 613C 6350-T1 ③	MD-M1	
A	2	2	40	↓	BOLT-1¼"-7UNC-2A-4¾ LG HEX HD HVY	P.O. 613C ㉑ 2600-C38	↓	
A	3	3	40	↓	NUT-1¼"-7UNC-2B, HEX HVY	↓ ⑮	↓	
A	4	4	24	↓	½" LINER, ABS STEEL 5" X 5" X ½" THK	71-30-780	X10-M1	
A	5	5	8	↓	½" LINER, ABS STEEL 7" X 3" X ½" THK	71-30-515	↓	
A	6	6	8	F-212	BOLT FOR SWAY BRACE 1⅜"-6UNC-2A-3¾ LG, HEX HD HVY	P.O. 613C ㉚ 2600-C38	MD-M1	
A	7	7	8	F-213	NUT FOR F-212 1⅜"-6UNC-2B, HEX HVY	↓ ㉜	↓	
D	8	8	1	F-220	C.O. SEPERATOR TK & STRAINER NO. 2	P.O. 613C 6350-T1 ③	↓	
A	9	9	1	F-221	C.O. SEPERATOR TK & STRAINER NO. 3	↓ ③	↓	
A	10	10	1	F-222	C.O. SEPERATOR TK & STRAINER NO. 4	↓ ③	↓	

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY-ASTM-A307, GR-B, STL ZINC COATED.
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

X10-150
M1-152

SERVICE - C.O. SEP TK & STR CARGO PUMP RM FR 58-59
GROUP NO. 2600-0201-1001 PI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 257706 SHEET 4 REV. D

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	1	F-209	VAC. STRIPP RESERVOIR TK (C.O.) NO. 1	P.O. 613C 6350-T1 ③	MD-M1	
A	2	2	16	↓	BOLT-⅝"-11UNC-2A, 1¾" LG HEX HD HVY	P.O. 613C ㉔ 2600-C38	↓	
A	3	3	16	↓	NUT-⅝"-11UNC-2B, HEX HVY	↓ ㉝	↓	
		4						
D	5	5	1	F-226	VAC-STRIPP RESERVOIR TK (C.O.) NO. 2	P.O. 613C 6350-T1 ③	MD-M1	
A	6	6	1	F-227	VAC STRIPP RESERVOIR TK (C.O.) NO. 3	↓ ③	↓	
A	7	7	1	F-228	VAC STRIPP RESERVOIR TK (C.O.) NO. 4	↓ ③	↓	

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307. GR-B. STL ZINC COATED.
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

M1-157

SERVICE - RESERVOIR TANK FOR C.O. SYS 33' FLAT, FWD FR-58
GROUP NO. 2600-0104-1003 PI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 257706 SHEET 5 REV. D

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	1	F-211	CARGO TK CLEAN HEATER AND DRAIN COOLER	P.O. 613C 6402-C2 ⑤	MD-M1	
A	2	2	8	↓	BOLT, 1"-8UNC-2A, 2½" LG HEX HD HVY	P.O. 613C ㉘ 2600-C38	↓	
A	3	3	8	↓	NUT-1"-8UNC-2B, HEX HVY	↓ ⑰	↓	

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, STEEL ZINC COATED.
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

M1-157

SERVICE - TK CLEANING HTR, 5' ABV BL FWD FR 58
GROUP NO. 2600-0110-1004 PI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 257706 SHEET 6 REV. A

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	1	F-210	VAC STRIPP RESERVOIR TK, (SEG BALL)	P.O. 613C 6350-T2 ③	MD-M1	
A	2	2	4	↓	BOLT-⅝"-11UNC-2A, 1¾" LG HEX HD HVY	P.O. 613C ㉔ 2600-C38	↓	
A	3	3	4	↓	NUT-⅝"-11UNC-2B, HEX HVY	↓ ㉝	↓	

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR B, STL ZINC COATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

M1-157

SERVICE - RESERVOIR TANK FOR BALL SYS, 33'-0 FLAT FWD FR 58
GROUP NO. 2280-0104-1003 PI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 257706 SHEET 7 REV. C

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	1	F-201	BALLAST PUMP WITH THE FOLLOWING ITEMS	P.O. 613C 6350-T2 ①	MD-M1	
A	2	2	9	↓	BOLT-1¼"-7UNC-2A. 5¼ LG. HEX HD HVY.	P.O. 613C ㉒ 2600-C38	↓	
A	3	3	9	↓	NUT-1¼"-7UNC-2B, HEX HVY	↓ ⑮	↓	
A	4	4	1	↓	½" LINER, ABS STEEL 17" X 8" X ½" THK	72-40-290	X10-M1	
A	5	5	2	↓	½" LINER, ABS STEEL 22" X 8" - ½" THK	↓	↓	

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR B, STL ZINC COATED.
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

X10-150
M1-152

SERVICE - SEGREGATED BALL PUMP FR 58-59, CARGO PUMP RM
GROUP NO. 6350-0201-1003 PI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 257706 SHEET 8 REV. A

257706

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME
8X

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	1	F-206	BALL. SYS. SEPERATOR TK & STRAINER	P.O. 613C 6350-T2 ③	MD-MI	
A	2	2	10	↓	BOLT-$1\frac{1}{4}$"-7UNC-2A-$4\frac{3}{4}$LG. HEX HD HVY.	P.O. 613C 2600-C38 ㉑		
A	3	3	10	↓	NUT-$1\frac{1}{4}$"-7UNC-2B-HEX HVY	↓ ⑮		
A	4	4	6	↓	$\frac{1}{2}$" LINER, ABS STEEL 5"X5"X$\frac{1}{2}$" THK	71-30-780	X10-MI	
A	5	5	2	↓	$\frac{1}{2}$" LINER, ABS STEEL 7"X3"X$\frac{1}{2}$" THK	71-30-515		
A	6	6	2	F-212	BOLT FOR SWAY BRACE $1\frac{3}{8}$"-6UNC-2A $3\frac{3}{4}$LG, HEX HD HVY	P.O. 613C 2600-C38 ㉚	MD-MI	
A	7	7	2	F-213	NUT FOR F-212 $1\frac{3}{8}$"-6UNC-2B, HEX HVY	↓ ㉜		
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		9						
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REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, STL ZINC COATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

X10-150
MI-152

SERVICE - SEG. BALL SEP TK & STR. CARGO PUMP RM FR 58-59
GROUP NO. 2280-0201-2105 PI

APPLICABLE HULLS	613C	614C
	YES	YES

DWG NO. 257706 SHEET 9 REV. A

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	1	F-200	CARGO OIL PUMP NO. 1	P.O. 613C 6350-T1 ①	MD-MI	
A	2	2	24	↓	$1\frac{1}{2}$" BOLT-6UNC-2A-$5\frac{1}{4}$"LG HEX HD HVY	P.O. 613C 2600-C38 ㉓		
A	3	3	24	↓	$1\frac{1}{2}$ NUT-6UNC-2B HEX HVY	↓ ⑳		
A	4	4	12	↓	$\frac{1}{2}$" LINER, ABS STEEL 12"X6" X$\frac{1}{2}$" THK	71-30-860	X10-MI	
A	5	5	1	F-214	CARGO OIL PUMP NO. 2	P.O. 613C 6350-T1 ①	MD-MI	
A	6	6	1	F-215	CARGO OIL PUMP NO. 3	↓ ①		
A	7	7	1	F-216	CARGO OIL PUMP NO. 4	↓ ①		
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		16						
		17						
		18						

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307
GR-B, STEEL ZINC COATED.
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2.

X10-150
MI-152

SERVICE - C.O. PUMPS FR 58-59
GROUP NO. 6350-0201-1001 PI

APPLICABLE HULLS	613C	614C
	YES	YES

DWG NO. 257706 SHEET 10 REV. A

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	1	F-202	BILGE AND STRIPP PUMP	P.O. 613C 6350-T5 ①	MD-MI	
A	2	2	4	↓	BOLT-$1\frac{1}{8}$"-7UNC-2A,$4\frac{1}{2}$"LG. HEX HD HVY	P.O. 613C 2600-C38 ㉙		
A	3	3	2	↓	BOLT-$\frac{3}{4}$"-10UNC-2A,$3\frac{3}{4}$"LG HEX HD HVY	↓ ㉖		
A	4	4	4	↓	NUT-$1\frac{1}{8}$"-7UNC-2B, HEX HVY	↓ ⑲		
A	5	5	2	↓	NUT-$\frac{3}{4}$"-10UNC-2B, HEX HVY	↓ ⑱		
A	6	6	4	↓	$\frac{1}{2}$" LINER, ABS STEEL $3\frac{1}{2}$X$3\frac{1}{2}$SQ X$\frac{1}{2}$"THK	71-30-585	X10-MI	
A	7	7	2	↓	$\frac{1}{2}$" LINER, ABS STEEL 6"X6"SQ X$\frac{1}{2}$" THK	71-30-860		
A	8	8	2	↓	BOLT $\frac{7}{8}$" 9UNC-2A 2"LG HEX HD HVY	P.O. 613C 2600-C38 ㉗	MD-MI	
A	9	9	2	↓	NUT-$\frac{7}{8}$ 9UNC-2B HEX HVY	↓ ⑯		
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		16						
		17						
		18						

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307
GR-B, STEEL ZINC COATED.
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

X10-150
MI-152

SERVICE - BILGE & STRIPP PUMP FR 59-60 P.
GROUP NO. 6350-0201-1002 PI

APPLICABLE HULLS	613C	614C
	YES	YES

DWG NO. 257706 SHEET 11 REV. A

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	1	F-203	VAC. STRIPP VACUUM PUMP (CO) NO. 1	P.O. 613C 6350-T1 ③	MD-MI	
A	2	2	16	↓	BOLT-$\frac{1}{2}$"-13UNC-2A-$2\frac{1}{4}$"LG HEX HD HVY	P.O. 613C 2600-C38 ㉕		
A	3	3	16	↓	NUT-$\frac{1}{2}$"-13UNC-2B, HEX HVY	↓ ㉛		
A	4	4	8	↓	$\frac{1}{2}$" LINER, ABS STEEL $7\frac{1}{8}$"X2"X$\frac{1}{2}$" THK	71-30-345	X10-MI	
A	5	5	1	F217	VAC. STRIPP VACUUM PUMP (CO) NO. 2	P.O. 613C 6350-T1 ③	MD-MI	
A	6	6	1	F218	VAC. STRIPP VACUUM PUMP (CO) NO. 3	↓		
A	7	7	1	F219	VAC. STRIPP VACUUM PUMP (CO) NO. 4	↓		
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		18						

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307,
GR-B, STL ZINC COATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

X10-158
MI-160

SERVICE - VAC STRIPPING PUMP FOR C.O. SYS. 33'-0 LEV. FWD FR 58
GROUP NO. 6350-0104-1004 PI

APPLICABLE HULLS	613C	614C
	YES	YES

DWG NO. 257706 SHEET 12 REV. C

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	1	F-204	VAC. STRIPP VACUUM PUMP (SEG BALL)	P.O. 613C 6350-T2 ③	MD-MI	
A	2	2	4	↓	BOLT-$\frac{1}{2}$"-13UNC-2A-$2\frac{1}{4}$ LG, HEX HD HVY.	P.O. 613C 2600-C38 ㉕		
A	3	3	4	↓	NUT-$\frac{1}{2}$"-13UNC-2B-HEX HVY	↓ ㉛		
A	4	4	2	↓	$\frac{1}{2}$" LINER-ABS STEEL $7\frac{1}{8}$"X 2" X $\frac{1}{2}$" THK	71-30-345	X10-MI	
		5						
		6						
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		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
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		18						

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, STL ZINC COATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2.

X10-158
MI-160

SERVICE - VAC. STRIPPING PUMP FOR SEG. BALL SYS 33'-0 LEV. FWD FR. 58
GROUP NO. 6350-0104-1005 PI

APPLICABLE HULLS	613C	614C
	YES	YES

DWG NO. 257706 SHEET 13 REV. C

GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D	1	1	1	F207	INTERCEPTOR FILTER (CO) NO 1	PO 613C 6350-T1 ③	MD-MI	
A	2	2	1	F223	↓ (CO) NO2	↓		
A	3	3	1	F224	↓ (CO) NO3	↓		
A	4	4	1	F225	↓ (CO) NO4	↓		
A	5	5	16	↓	BOLT-$\frac{3}{4}$"10UNC-2A HEX-HD HVY $2\frac{1}{2}$"LG	PO 613C 2600-C38 (54)		
A	6	6	16	↓	NUT-$\frac{3}{4}$-10UNC-2B HEX HVY	↓ ⑱		
A	7	7	8	↓	$\frac{1}{2}$" LINER-ABS STEEL 9"X2"X$\frac{1}{2}$"	71-30-345	X10-MI	
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		13						
		14						
		15						
		16						
		17						
		18						

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, STL ZINC COATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2.

X10-169
MI-171

SERVICE - INTERCEPTOR FILTER FOR SEG BALL
GROUP NO. 2600-1901-1005 PI

APPLICABLE HULLS	613C	614C
	YES	YES

DWG NO. 257706 SHEET 14 REV. D

GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	1	F208	INTERCEPTOR FILTER (SEG BALL)	PO 613C 6350-T2 ③	MD-MI	
A	2	2	4	↓	BOLT-$\frac{3}{4}$"-10UNC-2A HEX HD HVY $2\frac{1}{2}$"LG	PO 613C 2600-C38 (54)		
A	3	3	4	↓	NUT-$\frac{3}{4}$"-10UNC-2B HEX HVY	↓ ⑱		
A	4	4	2	↓	$\frac{1}{2}$" LINER-ABS STEEL 9X2"X$\frac{1}{2}$" THK	71-30-345	X10-MI	
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		16						
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		18						

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, STL ZINC COATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2.

X10-169
MI-171

SERVICE - INTERCEPTOR FILTER FOR SEG BALL
GROUP NO. 2280-1901-1006 PI

APPLICABLE HULLS	613C	614C
	YES	YES

DWG NO. 257706 SHEET 15 REV. D

LIST OF MATERIAL & INSTALLATION GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MAT'L SPEC	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	1	—	WINCH NO.13- COMB. FLA/ MOORING WINCH (REF 18) *	P.O. 613C-2015-C1 (3-D)	MD-MI	
B	2	2	2	STEEL ABS GR A	LINER, 18 LG × 6 WIDE × $\frac{1}{2}$ THK (SEE NOTE 2)	M.O. 2015-37 SH4, LN 1	ST-MI	
B	3	3	18	ASTM-A193 GR B7	BOLT, HX-HD $1\frac{5}{8}$-8UN-2A L=6.0"	P.O. 613C-2015-C2 ②	MD-MI	
B	4	4	18	ASTM A194 GR 2H	NUTS, HEX $1\frac{5}{8}$-8UN-2B HVY SERIES	P.O. 613C-6100-C2 ④		
B	5	5	1	STEEL ABS GR A	CHOCK, FICS #9-29900-1 ON REF 8	M.O. 2015-37 SH4, LN 2	ST-MI	
B	6	6	1	↓	CHOCK, FICS #9-29900-2 ON REF 8	MO 2015-37 SH4, LN 3		
B	7	7	2	↓	CHOCK, FICS #9-29901-1 ON REF 8	MO 2015-37 SH4, LN 4		
B	8	8	2	↓	CHOCK, FICS #9-29901-2 ON REF 8	MO 2015-37 SH4, LN 5		
B	9	9	2	↓	SHEAR CHOCK KEYS FOR ITEMS 5 & 6 (L=7¼)	MO 2015-37 SH4, LN 6		
B	10	10	4	↓	SHEAR CHOCK KEYS FOR ITEMS 7 & 8 (L=9¾)	MO 2015-37 SH4, LN 7		
		11						
B	10	12	1	—	WINCH NO.12- SINGLE DRUM W/GYPSY TO LEFT (REF 20) *	PO 613C-2015-C1 (3-A)	MD-MI	
B	2	13	2	STEEL ABS GR A	LINER, 18 LG × 6 WIDE × $\frac{1}{2}$ THK (SEE NOTE 2)	MO 2015-37 SH4, LN 1	ST-MI	
B	3	14	14	ASTM A193 GR B7	BOLT, HX-HD $1\frac{5}{8}$-8UN-2A L=6.0"	PO 613C-2015-C2 ②	MD-MI	
B	4	15	14	ASTM A194 GR 2H	NUTS, HEX $1\frac{5}{8}$-8UN-2B HVY SERIES	PO 613C-6100-C2 ④		
B	5	16	1	STEEL ABS GR A	CHOCK, FICS #9-29900-1 OF REF 8	MO 2015-37 SH4, LN 2	ST-MI	
B	6	17	1	↓	CHOCK, FICS #9-29900-2 ON REF 8	MO 2015-37 SH4, LN 3		
B	7	18	2	↓	CHOCK, FICS #9-29901-1 ON REF 8	MO 2015-37 SH4, LN 4		

REMARKS - * FOR FDN & LOCATION SEE REF 8

MI-180

SERVICE - WINCHES, FDN BOLTS, LINERS, SHEAR CHOCKS, & SHEAR CHOCK KEYS
GROUP NO. 2015-0405-1001 SI

APPLICABLE HULLS	613C	614C
	YES	YES

DWG NO. 257706 SHEET 16 REV. B

LIST OF MATERIAL & INSTALLATION GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MAT'L SPEC	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	8	1	2	STEEL ABS GR A	CHOCK, FICS #9-29901-2 ON REF 8	MO 2015-37 SH4, LN 5	ST-MI	
B	9	2	2	↓	SHEAR CHOCK KEYS FOR ITEMS 5 & 6 (L=7 1/4)	MO 2015-37 SH4, LN 6		
B	10	3	4	↓	SHEAR CHOCK KEY FOR ITEMS 7 & 8 (L=9 3/4)	MO 2015-37 SH4, LN 7		
		4						
B	11	5	1	—	WINCH NO. 11, SINGLE DRUM W/GYPSY TO LEFT (REF 20) *	P.O. 613C-2015-C1 (3-A)	MD-MI	
B	2	6	2	STEEL ABS GR A	LINER, 18 LG × 6 WIDE × $\frac{1}{2}$ THK (SEE NOTE 2)	MO 2015-37 SH4, LN 1	ST-MI	
B	3	7	14	ASTM-A193 GR B7	BOLT, HX-HD $1\frac{5}{8}$-8UN-2A L=6.0"	P.O. 613C-2015-C2 ②	MD-MI	
B	4	8	14	ASTM-A194 GR 2H	NUTS, HEX $1\frac{5}{8}$-8UN-2B HVY SERIES	P.O. 613C-6100-C2 ④		
B	5	9	1	STEEL ABS GR A	CHOCK, FICS #9-29900-1 ON REF 8	MO 2015-37 SH4, LN 2	ST-MI	
B	6	10	1	↓	CHOCK, FICS #9-29900-2 ON REF 8	MO 2015-37 SH4, LN 3		
B	7	11	2	↓	CHOCK, FICS #9-29901-1 ON REF 8	MO 2015-37 SH4, LN 4		
B	8	12	2	↓	CHOCK, FICS #9-29901-2 ON REF 8	MO 2015-37 SH4, LN 5		
B	9	13	2	↓	SHEAR CHOCK KEYS FOR ITEMS 5 & 6 (L=7 1/4)	MO 2015-37 SH4, LN 6		
B	10	14	4	↓	SHEAR CHOCK KEYS FOR ITEMS 7 & 8 (L=9 3/4)	MO 2015-37 SH4, LN 7		
		15						
B	12	16	1	—	WINCH NO. 10, SINGLE DRUM NO GYPSY (REF 19) *	PO 613C-2015-C1 (3-C)	MD-MI	
B	2	17	2	STEEL ABS GR A	LINER, 18 LG × 6 WIDE × $\frac{1}{2}$ THK (SEE NOTE 2)	MO 2015-37 SH4, LN 1	ST-MI	
B	3	18	14	ASTM-A193 GR B7	BOLT, HX-HD $1\frac{5}{8}$-8UN-2A L=6.0"	PO 613C-2015-C2 ②	MD-MI	

REMARKS - * FOR FDN & LOCATION SEE REF 8

MI-180

SERVICE - WINCHES, FDN BOLTS, LINERS, CHOCKS & SHEAR CHOCK KEYS
GROUP NO. 2015-0405-1001 SI

APPLICABLE HULLS	613C	614C
	YES	YES

DWG NO. 257706 SHEET 17 REV. B

257706
MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME
8X

LIST OF MATERIAL & INSTALLATION GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MAT'L SPEC	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	4	1	14	ASTM-A194 GR 2H	NUTS, HEX 1⅝-8UN-2A HVY SERIES	PO 613C-6100-C2 ④	MD-ml	
B	5	2	1	STEEL ABS GRA	CHOCK, FICS#9-29900-1 ON REF 8	MO 2015-37 SH4, LN 2	ST-ml	
B	6	3	1	↓	CHOCK, FICS#9-29900-2 ON REF 8	MO 2015-37 SH4, LN3		
B	7	4	2	↓	CHOCK, FICS#9-29901-1 ON REF 8	MO 2015-37 SH4, LN4		
B	8	5	2	↓	CHOCK, FICS#9-29901-2 ON REF 8	MO 2016-37 SH4, LN5		
B	9	6	2	↓	SHEAR CHOCK KEYS FOR ITEMS 5&6 (L=7 1/4)	MO 2015-37 SH4, LN6		
B	10	7	4	↓	SHEAR CHOCK KEY FOR ITEMS 7&8 (L=9 3/4)	MO 2015-37 SH4, LN7		
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

ml-180

SERVICE - WINCHES, FDN BOLTS, LINERS, CHOCKS & SHEAR CHOCK KEYS

GROUP NO. 2015-0405-1001 SI

APPLICABLE HULLS	613C	614C
	YES	YES

DRG NO. 257706 SHEET 18 REV. B

LIST OF MATERIAL & INSTALLATION GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MAT'L SPEC	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	1	—	WINCH NO. 9, DOUBLE DRUM W/GYPSY TO LEFT (REF 22) *	PO 613C-2015-C1 (2-A)	MD-ml	
B	2	2	4	STEEL ABS GRA	LINER, 18LG×6WIDE×½THK (SEE NOTE 2)	MO 2015-37 SH4, LN1	ST-ml	
B	3	3	20	ASTM-A193 GR B7	BOLTS, HX-HD 1⅝-8UN-2A L=6.0"	PO 613C-2015-C2 ②	MD-ml	
B	4	4	20	ASTM-A194 GR 2H	NUTS, HEX 1⅝-8UN-2B HVY SERIES	P.O. 613C-6100-C2 ④		
B	5	5	2	STEEL ABS GRA	CHOCK, FICS#9-29900-1 ON REF 9	MO 2015-37 SH4, LN2	ST-ml	
B	6	6	2	↓	CHOCK, FICS#9-29900-2 ON REF 9	MO 2015-37 SH4, LN3		
B	7	7	2	↓	CHOCK, FICS#9-29901-1 ON REF 9	MO 2015-37 SH4, LN4		
B	8	8	2	↓	CHOCK, FICS#9-29901-2 ON REF 9	MO 2015-37 SH4, LN5		
B	9	9	4	↓	SHEAR CHOCK KEYS FOR ITEMS 5&6 (L=7 1/4)	MO 2015-37 SH4, LN6		
B	10	10	4	↓	SHEAR CHOCK KEYS FOR ITEMS 7&8 (L=9 3/4)	MO 2015-37 SH4, LN7		
		11						
B	10	12	1	—	WINCH NO. 8, DOUBLE DRUM W/GYPSY TO RIGHT (REF 21) *	PO 613C-2015-C1 (1-A)	MD-ml	
B	2	13	4	STEEL ABS GRA	LINER, 18LG×6WIDE×½THK (SEE NOTE 2)	MO 2015-37 SH4, LN1	ST-ml	
B	3	14	20	ASTM-A193 GR B7	BOLT, HX-HD 1⅝-8UN-2A L=6.0"	PO 613C-2015-C2 ②	MD-ml	
B	4	15	20	ASTM-A194 GR 2H	NUTS, HEX 1⅝-8UN-2B HVY SERIES	PO 613C-6100-C2 ④		
B	5	16	2	STEEL ABS GRA	CHOCK, FICS#9-29900-1 ON REF 9	MO 2015-37 SH4, LN2	ST-ml	
B	6	17	2	↓	CHOCK, FICS#9-29900-2 ON REF 9	MO 2015-37 SH4, LN3		
B	7	18	2	↓	CHOCK, FICS#9-29901-1 ON REF 9	MO 2015-37 SH4, LN4		

REMARKS - * FOR FDN & LOCATION SEE REF 9

ml-190

SERVICE - WINCHES, FDN BOLTS, LINERS, CHOCKS, & SHEAR CHOCK KEYS

GROUP NO. 2015-2301-1001 SI

APPLICABLE HULLS	613C	614C
	YES	YES

DRG NO. 257706 SHEET 19 REV. B

LIST OF MATERIAL & INSTALLATION GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MAT'L SPEC	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	8	1	2	STEEL ABS GRA	CHOCK, FICS#9-29901-2 ON REF 9	MO 2015-37 SH4, LN5	ST-ml	
B	9	2	4	↓	SHEAR CHOCK KEYS FOR ITEMS 5&6 (L=7 1/4)	MO 2015-37 SH4, LN6		
B	10	3	4	↓	SHEAR CHOCK KEYS FOR ITEMS 7&8 (L=9 3/4)	MO 2015-37 SH4, LN7		
		4						
B	11	5	1	—	WINCH NO. 7, SINGLE DRUM W/GYPSY TO RIGHT (REF 20) *	PO 613C-2015-C1 (3-B)	MD-ml	
B	2	6	2	STEEL ABS GRA	LINER, 18LG×6WIDE×½THK (SEE NOTE 2)	MO 2015-37 SH4, LN1	ST-ml	
B	3	7	14	ASTM-A193 GR B7	BOLT, HX-HD 1⅝-8UN-2A L=6.0"	PO 613C-2015-C2 ②	MD-ml	
B	4	8	14	ASTM-A194 GR 2H	NUTS, HEX 1⅝-8UN-2B HVY SERIES	PO 613C-6100-C2 ④		
B	5	9	1	STEEL ABS GRA	CHOCK, FICS#9-29900-1 ON REF 9	MO 2015-37 SH4, LN2	ST-ml	
B	6	10	1	↓	CHOCK, FICS#9-29900-2 ON REF 9	MO 2015-37 SH4, LN3		
B	7	11	2	↓	CHOCK, FICS#9-29901-1 ON REF 9	MO 2015-37 SH4, LN4		
B	8	12	2	↓	CHOCK, FICS#9-29901-2 ON REF 9	MO 2015-37 SH4, LN5		
B	9	13	2	↓	SHEAR CHOCK KEYS FOR ITEMS 5&6 (L=7 1/4)	MO 2015-37 SH4, LN6		
B	10	14	4	↓	SHEAR CHOCK KEYS FOR ITEMS 7&8 (L=9 3/4)	MO 2015-37 SH4, LN7		
		15						
B	12	16	1	—	WINCH NO. 6, DOUBLE DRUM W/GYPSY TO RIGHT (REF 21) *	PO 613C-2015-C1 (1-A)	MD-ml	
B	2	17	4	STEEL ABS GRA	LINER, 18LG×6WIDE×½THK (SEE NOTE 2)	MO 2015-37 SH4, LN1	ST-ml	
B	3	18	20	ASTM-A193 GR B7	BOLT, HX-HD 1⅝-8UN-2A L=6.0"	PO 613C-2015-C2 ②	MD-ml	

REMARKS - * FOR FDN & LOCATION SEE REF 9

ml-190

SERVICE - WINCHES, FDN BOLTS, LINERS, CHOCKS & SHEAR CHOCK KEYS

GROUP NO. 2015-2301-1001 SI

APPLICABLE HULLS	613C	614C
	YES	YES

DRG NO. 257706 SHEET 20 REV. B

LIST OF MATERIAL & INSTALLATION GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MAT'L SPEC	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	4	1	20	ASTM-A194 GR 2H	NUTS, HEX 1⅝-8UN-2B HVY SERIES	P.O. 613C-6100-C2 ④	MD-ml	
B	5	2	2	STEEL ABS GRA	CHOCK, FICS#9-29900-1 ON REF 9	MO 2015-37 SH4, LN2	ST-ml	
B	6	3	2	↓	CHOCK, FICS#9-29900-2 ON REF 9	MO 2015-37 SH4, LN3		
B	7	4	2	↓	CHOCK, FICS#9-29901-1 ON REF 9	MO 2015-37 SH4, LN4		
B	8	5	2	↓	CHOCK, FICS#9-29901-2 ON REF 9	MO 2015-37 SH4, LN5		
B	9	6	4	↓	SHEAR CHOCK KEYS FOR ITEMS 5&6 (L=7 1/4)	MO 2015-37 SH4, LN 6		
B	10	7	4	↓	SHEAR CHOCK KEYS FOR ITEMS 7&8 (L=9 3/4)	MO 2015-37 SH4, LN7		
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

ml-190

SERVICE - WINCHES, FDN BOLTS, LINERS, CHOCKS, & SHEAR CHOCK KEYS

GROUP NO. 2015-2301-1001 SI

APPLICABLE HULLS	613C	614C
	YES	YES

DRG NO. 257706 SHEET 21 REV. B

LIST OF MATERIAL & INSTALLATION GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MAT'L SPEC	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	1	—	WINCH NO. 1, COMB. FLA/MOORING WINCH (REF 18) *	PO 613C-2015-C1 (3-D)	MD-ml	
B	2	2	2	STEEL ABS GRA	LINER, 18LG×6WIDE×½THK (SEE NOTE 2)	MO 2015-37 SH4, LN1	ST-ml	
B	3	3	18	ASTM-A193 GR B7	BOLT, HX-HD 1⅝-8UN-2A L=6.0"	PO 613C-2015-C2 ②	MD-ml	
B	4	4	18	ASTM-A194 GR 2H	NUTS, HEX 1⅝-8UN-2B HVY SERIES	PO 613C-6100-C2 ④		
B	5	5	1	STEEL ABS GRA	CHOCK, FICS#9-29900-1 ON REF 10	MO 2015-37 SH4, LN2	ST-ml	
B	6	6	1	↓	CHOCK, FICS#9-29900-2 ON REF 10	MO 2015-37 SH4, LN3		
B	7	7	2	↓	CHOCK, FICS#9-29901-1 ON REF 10	MO 2015-37 SH4, LN4		
B	8	8	2	↓	CHOCK, FICS#9-29901-2 ON REF 10	MO 2015-37 SH4, LN5		
B	9	9	2	↓	SHEAR CHOCK KEYS FOR ITEMS 5&6 (L=7 1/4)	MO 2015-37 SH4, LN6		
B	10	10	4	↓	SHEAR CHOCK KEYS FOR ITEMS 7&8 (L=9 3/4)	MO 2015-37 SH4, LN7		
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS - * FOR FDN & LOCATION SEE REF 10

ml-198

SERVICE - WINCHES, FDN BOLTS, LINERS, CHOCKS, & SHEAR CHOCK KEYS

GROUP NO. 2015-1806-1001 SI

APPLICABLE HULLS	613C	614C
	YES	YES

DRG NO. 257706 SHEET 22 REV. B

LIST OF MATERIAL & INSTALLATION GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MAT'L SPEC	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	1	—	POWER ROPE STORAGE REEL - FWD (REF 23) *	PO 613C-2015-C1 (3-E)	MD-ml	
B	2	2	16	GR2, TY II ZN PLTD	BOLT, HX-HD 1-8UNC-2A L=3.0" (ABT)	21-02-650	ST-ml	
B	3	3	16	GR2, TY III ZN PLTD	NUTS, HEX 1-8UNC-2B	21-33-114		
		4						
B	4	5	1	—	FLEET ANGLE ELIMINATOR FWD (REF 23) *	PO 613C-2015-C1 (3-E)	MD-ml	
B	2	6	8	GR2, TY II ZN PLTD	BOLT, HX-HD 1-8UNC-2A L=3.0" (ABT)	21-02-650	ST-ml	
B	3	7	8	GR2, TY III ZN PLTD	NUT, HEX 1-8UNC-2B	21-33-114		
		8						
B	5	9	1	—	DIRECTION CHANGE SHEAVE - FWD (REF 23) *	PO 613C-2015-C1 (3-E)	MD-ml	
B	6	10	8	GR2, TY II ZN PLTD	BOLT, HEX-HD ¾-10UNC-2A L=3¼ (ABT)	21-02-480	ST-ml	
B	7	11	8	GR2, TY III ZN PLTD	NUT, HEX ¾-10UNC-2B	21-33-110		
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS - * FOR FDN & LOCATION SEE REF 12 & 17

ml-195

SERVICE - WINCHES, FDN BOLTS, LINERS, CHOCKS, & SHEAR CHOCK KEYS

GROUP NO. 2015-1804-1001 SI

APPLICABLE HULLS	613C	614C
	YES	YES

DRG NO. 257706 SHEET 23 REV. B

LIST OF MATERIAL & INSTALLATION GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MAT'L SPEC	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	1	—	POWER ROPE STORAGE REEL - AFT (REF 23) *	PO 613C-2015-C1 (3-E)	MD-ml	
B	2	2	16	GR2, TY II ZN PLTD	BOLT, HX-HD 1-8UNC-2A L=3.0" (ABT)	21-02-650	ST-ml	
B	3	3	16	GR2, TY III ZN PLTD	NUTS, HEX 1-8UNC-2B	21-33-114		
		4						
B	4	5	1	—	FLEET ANGLE ELIMINATOR AFT (REF 23) *	PO 613C 2015-C1 (3-E)	MD-ml	
B	2	6	8	GR2, TY II ZN PLTD	BOLT, HX-HD 1-8UNC-2A L=3.0" (ABT)	21-02-650	ST-ml	
B	3	7	8	GR2, TY III ZN PLTD	NUT, HEX 1-8UNC-2B	21-33-114		
		8						
B	5	9	1	—	DIRECTION CHANGE SHEAVE - AFT (REF 23) *	PO 613C 2015-C1 (3-E)	MD-ml	
B	6	10	8	GR2, TY II ZN PLTD	BOLT, HX-HD ¾-10UNC-2A L=3¼ (ABT)	21-02-480	ST-ml	
B	7	11	8	GR2, TY III ZN PLTD	NUT, HEX ¾-10UNC-2B	21-33-110		
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS - * FOR FDN & LOCATION SEE REF 12 & 17

ml-175

SERVICE - WINCHES, FDN BOLTS, LINERS, CHOCKS, & SHEAR CHOCK KEYS

GROUP NO. 2015-0404-1001 SI

APPLICABLE HULLS	613C	614C
	YES	YES

DRG NO. 257706 SHEET 24 REV. B

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D		1	1	F-230	DECK SEAL UNIT	P.O. 613C (1-28) 2730-C1	ST-M1	
D		2	8	↓	1" BOLT-8UNC-2A, 3½ LG HEX HD HVY	21-02-654	↓	
D		3	8	↓	1" NUT-8UNC-2B HEX HVY	P.O. 613C ⑤ 6000-C11	↓	
D		4	4	↓	½" LINER, ABS STEEL 12" x 8" x ½" THK	72-40-290	X10-M1	
		5						
		6						
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		17						
		18						

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY ASTM-A307, GR-B, STL ZINC COATED.
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

X10-178
M1-180

SERVICE - DECK SEAL, UP DK FWD FR 58

GROUP NO. 2730-0208-1002 PI

APPLICABLE HULLS	613C	614C
	YES	YES

DRG NO. 257706 SHEET 25 REV. D

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D		1	1	F-231	OILY WATER SEPARATOR MODEL 1500-1200	P.O. 613C ① 2400-T1	ST-M1	
		2						
		3						
		4						
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		17						
		18						

REMARKS -

M1-170

SERVICE - OIL WATER SEPARATOR UP DK, FWD FR 58, PORT

GROUP NO. 2280-0209-1202-PI

APPLICABLE HULLS	613C	614C
	YES	YES

DRG NO. 257706 SHEET 26 REV. D

257706

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
FRAME
8X

NN 3569

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FITTING NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D		1	2	F-232	10 TON STORAGE UNIT CHEMETRON DWG #D-32328	P.O. 613C 2400-C26	ST-M1	
		2						
		3						
		4						
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		18						

REMARKS -

SERVICE - IN CO_2 EQUIP. RM ON 111'-0 LEVEL PORT

M1-170

GROUP NO. 2400-1601-1214 PI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	YES	YES	257706	27	D

INSTALLATION GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MATL	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	1	SEE P.O.	QUAD CONTROL REMOTE CONTROL STATION	P.O. 613C-2015-C1	ST-M1	
	2	2	4	STEEL ASTM-A-307,GRB	BOLT, HEX HD ¾-10UNC-2A, L_1 = 2	97-60-505	↓	
	3	3	4	↓	NUT HEX, HVY ¾-10UNC-2B	21-34-216	↓	
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - DECK MACHY HYDRAULIC SYSTEM

M1-178 S.I.

GROUP NO. 2015-0405-1002

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	Yes	Yes	257706	28	D

INSTALLATION GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MATL	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	1	SEE P.O.	DUAL CONTROL REMOTE CONTROL STATION	P.O. 613C-2015-C1	ST-M1	
	2	2	4	STEEL ASTM-A-307,GRB	BOLT, HEX HD ¾-10UNC-2A, L_1 = 2	97-60-505	↓	
	3	3	4	↓	NUT, HEX, HVY ¾-10UNC-2B	21-34-216	↓	
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
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		16						
		17						
		18						

REMARKS -

SERVICE - DECK MACHY HYDRAULIC SYSTEM

M1-173 S.I.

GROUP NO. 2015-0306-1002

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	Yes	Yes	257706	29	D

INSTALLATION GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MATL	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
H	1	1	1	SEE P.O.	DUAL CONTROL REMOTE CONTROL STATION	P.O. 613C-2015-C1	ST-M1	
D	2	2	8	STEEL ASTM-A-307,GRB	BOLT, HEX HD ¾-10UNC-2A, L_1 = 2	97-60-505	↓	
D	3	3	8	↓	NUT, HEX, HVY 3/10-10UNC-2B	21-34-216	↓	
H	4	4	1	SEE P.O.	QUAD CONTROL REMOTE CONTROL STATION	P.O. 613C-2015-C1	↓	
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
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		16						
		17						
		18						

REMARKS -

SERVICE - DECK MACHY HYDRAULIC SYSTEM

M1-190 S.I.

GROUP NO. 2015-1406-1002

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	Yes	Yes	257706	30	H

INSTALLATION GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MAT'L	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	1	SEE P.O.	BRAKE PUMP & HYD. CONTROL POWER UNIT	P.O. 613C-2015-C1	ST-M1	
	2	2	4	STEEL ASTM-A-307,GRB	BOLTS, HEX HD ¾-10UNC-2A, L_1 = 2	97-60-505	↓	
	3	3	4	↓	NUTS, HEX, HVY ¾-10 UNC-2B	21-34-216	↓	
		4						
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		17						
		18						

REMARKS -

SERVICE - DECK MACHY HYDRAULIC SYSTEM

M1-190 S.I.

GROUP NO. 2015-1806-1002

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	Yes	Yes	257706	31	D

GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MATL.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	1	SEE P.O.	CRANE - ELECTRO HYDRAULIC, CARGO HOSE HANDLING	P.O. 613C-2000-C1 (1-A)	ST-M1	
		2						
		3						
		4						
		5						
		6						
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		16						
		17						
		18						

REMARKS -

SERVICE -

M1-177

GROUP NO. 2000-0807-1101 SI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	YES	YES	257706	32	D

GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MATL.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	1	SEE P.O.	CRANE - ELECTRO HYDRAULIC, CARGO HOSE HANDLING	P.O. 613C-2000-C1 (1-A)	ST-M1	
		2						
		3						
		4						
		5						
		6						
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		17						
		18						

REMARKS -

SERVICE -

M1-177

GROUP NO. 2000-0807-1201 SI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	YES	YES	257706	33	D

GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MATL.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	1	SEE P.O.	CRANE - ELECTRO HYDRAULIC FOR SHIP STORES	P.O. 613C-2000-C2 ①	ST-M1	
		2						
		3						
		4						
		5						
		6						
		7						
		8						
		9						
		10						
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		12						
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		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

M1-175

GROUP NO. 2000-0121-1101 SI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	YES	YES	257706	34	D

GROUP

REV.	ITEM NO.	LINE NO.	QTY (1 SHIP)	MATL.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	1	SEE P.O.	CRANE - ELECTRO HYDRAULIC FOR SHIP STORES	P.O. 613C-2000-C2 ①	ST-M1	
		2						
		3						
		4						
		5						
		6						
		7						
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		9						
		10						
		11						
		12						
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		16						
		17						
		18						

REMARKS -

SERVICE -

M1-175

GROUP NO. 2000-0121-1201 SI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	YES	YES	257706	35	D

257706

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SEPT. '80

FRAME

8X

INSTALLATION GROUP

REV.	ITEM NO	LINE NO.	QTY (1 SHIP)	MATL SPEC	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	1	—	COMBINATION ANCHOR WINDLASS/WINCH (PORT)	P.O. 613C-2011-C1 (1A)	ST-M1	
	2	2	24	STEEL ASTM-A-193 GR B7	BOLTS, HEX HD 2¼-8UN-2A L₁=7¾	P.O. 613C-2015-C2 ①		
	3	3	56		BOLTS, HEX. HD. 1⅝-8UN-2A L₁=6	P.O. 613C-2015-C2 ②		
	4	4	24	STEEL ASTM-A-194, GR 2H	NUTS, HEX, HVY 2¼-8UN-2B	P.O. 613C-6100-C2 ③		
	5	5	56		NUTS, HEX, HVY 1⅝-8UN-2B	P.O. 613C-6100-C2 ④		
	6	6	8	STEEL ABS GR A	SHEAR CHOCK KEY 7 × ¾ × 3 THK	M.O. 2011-163 SH 3, L1		
	7	7	4		SHEAR CHOCK KEY 9 × ¾ × 3¾ THK	M.O. 2011-163 SH 3, L2		
	8	8	16		SHEAR CHOCK KEY 10 × ¾ × 3 THK	M.O. 2011-163 SH 3, L3		
	9	9	4		SHEAR CHOCK KEY 21 × ¾ × 3¾ THK	M.O. 2011-163 SH 3, L4		
	10	10	1	—	COMBINATION ANCHOR WINDLASS/WINCH (STBD)	P.O. 613C-2011-C1 (2A)		
	11	11	4	STEEL ABS	LINER 6 × 17 × ¾ THK	72-40-370	X10-M1	
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS - 1. FOR FDN INFO. SEE NN DWG 1220-2637
2. QTYS. SHOWN FOR ITEMS 2-9 & 11 TO BE EQUALLY DIVIDED FOR ITEMS 1 & 10.

X10-185 MI-187 S.I.

SERVICE - COMBINATION ANCHOR WINDLASS/WINCH

GROUP NO. 2011-1805-1002

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	YES	YES	257706	36	D

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1		EMER. DIESEL OIL TANK	M.O 6150-177 SH 19 L1	ST-M1	
		2						
		3						
		4			WELD TO DECK			
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
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		15						
		16						
		17						
		18						

REMARKS - LOCATED IN DIESEL GEN ROOM

MI-175

SERVICE -

GROUP NO. 6150-0121-1204 SI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
			257706	37	D

INSTALLATION GROUP

REV.	ITEM NO	LINE NO.	QTY (1 SHIP)	MATL	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	1	SEE P.O.	HYD. POWER UNIT 10 GAL.	P.O. 613C-2015-C1	ST-M1	
	2	2	4	STEEL ASTM-A-307, GR B	BOLT, HEX. HD. ¾-10UNC-2A, L₁=1½	97-60-503		
	3	3	4		NUT, HEX, HVY ¾-10UNC-2B	21-34-216		
		4						
		5						
		6						
		7						
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		9						
		10						
		11						
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		15						
		16						
		17						
		18						

REMARKS - LOCATED IN DIESEL GEN. ROOM

MI-175 S.I.

SERVICE - DECK MACHY HYDRAULIC SYSTEM

GROUP NO. 2015-0121-1204

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	YES	YES	257706	38	D

1220-2968

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1		EMERGENCY DIESEL GENERATOR	P.O. 613C-4002-C2 IT. 1-A	ST-M1	
		2	1		GENERATOR HYD. STARTING CABINET			
		3						
		4			BOLTS & NUTS FOR EMER DIESEL GEN			
		5	20		½ REG HEX HEAD BOLTS L=1½	S/97-60-454	ST-M1	
		6	20		½ REG HEX HEAD NUTS	S/97-64-054		
		7						
		8			BOLTS & NUTS FOR GEN HYD STARTING CABINET			
		9	4		⅝ REG HEX HEAD BOLTS L=3"	S/97-60-492	ST-M1	
		10	4		⅝ REG HEX HEAD NUTS	S/97-64-056		
		11	6		¾ REG HEX HEAD BOLTS L=2½"	S/97-60-507		
		12	6		¾ REG HEX HEAD NUTS	S/97-64-057		
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS - LOCATED IN DIESEL GEN. ROOM

MI-175

SERVICE -

GROUP NO. 4002-0121-1203 SI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
			257706	39	D

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1		EMERGENCY SWITCHBD	P.O. 613C-4050-C1A IT. 2	ST-EL	
		2			WELD TO FDN			
		3						
		4						
		5						
		6						
		7						
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		17						
		18						

REMARKS - LOCATED IN DIESEL GEN ROOM

EL-175

SERVICE -

GROUP NO. 4100-0121-1004 SI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
			257706	40	D

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
E		1	69	F-7	FIXED TK CLEANING UNIT 4 METER	2600-T25 ①	ST-M1	
E		2	2	F-8	FIXED TK CLEANING UNIT 17.4 METER			
G		3	2	F-4	FIXED TK CLEANING UNIT 17.4 METER		ST-M1	
E		4			UNIT LOCATION AS LISTED 0208 1 PC F-7			
		5			0306 2 PCS F-7			
		6			0307 P 2 PCS F-7			
		7			0307 P 1 PC F-8	36" FWD FR 62		
		8			0307S 2 PCS F-7			
		9			0307S 1 PC F-8	36" FWD FR 62		
		10			0506 2 PCS F-7			
		11			0507P 2 PCS F-7			
		12			0507S 2 PCS F-7			
		13			0606 2 PCS F-7			
		14			0607 2 PCS F-7			
		15			0607 2 PCS F-7			
		16			0706 2 PCS F-7			
		17			0707P 2 PCS F-7			
		18			0707S 2 PCS F-7			

REMARKS -

MC
MI=161

SERVICE - FIXED TANK CLEANING UNITS UP DK ~ FR 58-109

GROUP NO. 2600-2301-1010 PI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	YES	YES	257706	41	G

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
E		1			0806 2 PCS F-7			
		2			0807P 2 PCS F-7			
		3			0807S 2 PCS F-7			
		4			0906 2 PCS F-7			
		5			0907P 2 PCS F-7			
		6			0907S 2 PCS F-7			
		7			1007P 2 PCS F-7			
		8			1007S 2 PCS F-7			
		9			1107P 2 PCS F-7			
		10			1107S 2 PCS F-7			
		11			1206 2 PCS F-7			
		12			1207P 2 PCS F-7			
		13			1207S 2 PCS F-7			
		14			1306 2 PCS F-7			
		15			1307P 2 PCS F-7			
		16			1307S 2 PCS F-7			
		17			1406 2 PCS F-7			
		18			1407P 2 PCS F-7			

REMARKS -

MC
MI=161

SERVICE - FIXED TANK CLEANING UNITS UP DK ~ FR 58-109

GROUP NO. 2600-2301-1010-PI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	YES	YES	257706	42	E

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
E		1			1407S 2 PCS F-7			
E		2			1506 2 PCS F-7			
E		3			1507P 2 PCS F-7			
F		4			1507P 1 PC F-4	24" FWD FR 108		
E		5			1507S 2 PCS F-7			
F		6			1507S 1 PC F-4	24" FWD FR 108		
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

MC
MI=161

SERVICE - FIXED TANK CLEANING UNITS UP DK ~ FR 58-109

GROUP NO. 2600-2301-1010 PI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	YES	YES	257706	43	F

257706

MICRO-MASTER® 105 mm
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FRAME

8X

ENB VAULT

FILE D37

GROUP: MC NO.

3-24-75
3ENB
MEM
CSC
2WTD
SEPIA/CSD
M21 (mold loft
-21-75
ENB
MEM
CSC
WTD

SEPIA/1032
M-21 (mold loft
JD 2/CS
4-16-76
3ENB
MEM
CSC
2WTD
sepia/1032
ML

11-15-76
ENB
MEM
AC
2WTD
CSD-V
Sepia
ABS Local
MAIL RM
6 X10A
4 X14
9 X11
9 X14
3 SH
Ry/sepia

REPRODUCTION OFFICE

YARD PRINTS YES GROUPING NO
PRINTS ENB, MEM, JWH, 2 WTD, CSD-V
SEPIA/1X10, M-21 (MOLD LOFT), ABS LOCAL, 10 MAIL RM
REMARKS REV G
DATE 9-21-77 SIGNED ML Moore

APPROVALS	
OWNERS	
APPD	DATE
PATA	1/9/75
ELL	1/21/75
ABS	
APPD	DATE
	3/6/75
MARAD	
APPD	DATE
COAST GUARD	
APPD	DATE
	3-21-5

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615	311	
614	310	
613	309	

NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY
NEWPORT NEWS, VIRGINIA
FSCM NO. 43689
COMMERCIAL SHIP DESIGN DEPT

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SCALE NONE = 1 FT. DATE COMPL 12-17-74
DRAWN G. R. Bales EXAMINED
CHECKED R. F. Carmine AUTHORIZED E B Foster
SUPVR ML Moore 12/17/74 DATE 12-17-74

TECH APPROVAL
NOT REQUIRED
CSD APPROVAL
J. R. Thenstead

TITLE
390,000 DWT TANKER
GENERAL NOTES PERTAINING TO HULL STRUCTURE

U S M A DESIGN T11-S-116a
~~U S M A DWG NO.~~ ~~HULL NO.~~

DWG NO. 0100-749 REV G SHEET NO. 1 OF 12

HERCULENE® DRAFTING FILM 74070 MI-11X8½

REVISIONS

COST CHG NO. NN	COST CHG NO. NAVSHIPS	REV	SH NO.	DESCRIPTION		NNS&DD CO DATE	NNS&DD CO AUTHD	USN DATE	USN APPD
		A		INITIAL ISSUE	GRB RFC				
		B	1	OWNERS APPROVAL AND ABS APPROVAL ADDED.				4-11-5	ZAPATA
			6	NOTE #13 ADDED.					
			9	NOTE #6,8 & 10 ALTERED.					
			10	NOTE #16 ADDED; ALL TO SUIT WELDING ENGINEER'S COMMENT PRINT.					
			11	NOTE #9 ADDED TO FACILITATE FABRICATION.		3-17-5			
			7	NOTE #4 ADDED.	GRB RFC				
		C	7	NOTE #3-ALTERED.					
			9	NOTES #12 & 13 ALTERED.					
			10	NOTES #14 & 16 ALTERED AND NOTES #17 & 18 ADDED.	GRB	4-10-5		5-6-5	SHELL
		D	10A	NOTE #19 ADDED.	G.F.B. RFC	4-5-6 MEM		5-12-76	ZAPATA
		E	4	DWG NO OF REF #4 ALT.				12-2-6	SHELL
			4	REF #7 ADDED.				1-27-7	ZAPATA
			10A	NOTE IN TABLE ALT TO "OVER 45° USE DET 7-U, REF #7."	GRB RFC	10-22-6 MEM			
		F	11A	NOTE #10 & SHT 11A ADDED (FOR CLARIFICATION).	NSP	4-18-7 MEM		7-14-77	ZAPATA
		G	6	NOTE #14 ADDED. (PLAN CLARIFICATION)				11-22-77	Zapata
			11A	NOTE #11 ADDED. THIS INCORPORATES LIAISON SK DATED 5-23-77.	KPM	9-21-7 MEM			

HULL NO. 613 DWG. NO. 0100-749 REV. G
REVISIONS SHEET 2

K&E 19 1253 3-73 W-2607• MN7-8½X11 (REV. 1)

TABLE OF CONTENTS	
SHT NO.	TITLE
1	TITLE SHEET
2	REVISIONS
3	TABLE OF CONTENTS
4	REFERENCES
5	SECTION I - GENERAL
6	SECTION II - DIMENSIONS
7	SECTION III - MATERIAL
8	SECTION IV - PREPARATION OF MATERIAL
9-10-10A	SECTION V - WELDING
11-12	SECTION VI - MISCELLANEOUS

HULL NO. 613 DWG NO. 0100-749 REV. A
TABLE OF CONTENTS SHEET 3

K&E 19 1253 3-73 W-2607• MN 10-8½X11 (REV. 1)

NO.	REFERENCES	DWG NO.
1	SPECIFICATIONS FOR CONSTRUCTION OF A 390,000 DWT TANKER	
2	STRUCTURAL ATTACHMENT WELDS	HM-0100-756
3	STANDARD WELD JOINT DESIGN	H-60/160/260
4	N.N. WELDING PROCEDURE	W-302
5	PAINTING SCHEDULE SHEET 1	8300-40
6	PAINTING SCHEDULE SHEET 2	8300-41
7	STRUCTURAL DETAILS	0100-750

HULL NO. 613 DWG NO. 0100-749
REFERENCES SHEET 4 OF

K&E 19 1253 5-72 2397• MN9-8½X11

SECTION I - GENERAL

1. THE PURPOSE OF THIS DRAWING IS TO COLLECT GENERAL TYPE INFORMATION FOR CONVENIENT REFERENCE THEREBY MINIMIZING THE NUMBER OF GENERAL NOTES NEEDED ON STRUCTURAL WORKING DRAWINGS. THE INFORMATION INCLUDED HEREIN IS NOT INTENDED TO REPRESENT ALL THE FABRICATION REQUIREMENTS OF REFERENCE NUMBER 1, NOR DOES IT SUPERSEDE SPECIFIC REQUIREMENTS NOTED ON WORKING DRAWINGS.

HULL NO. 613 DWG NO. 0100-749 REV. A
SECTION I GENERAL SHEET 5

19 1253 3-73 W-2607• MN 10-8½X11 (REV. 1)

SECTION II - DIMENSIONS

1. FRAME SPACING TO BE AS FOLLOWS:

FORWARD FRAME 109	24"
FRAME 61 TO 109	17'-11"
FRAME 58 TO 61	16'-8"
FRAME 21 TO 58	36"
AFT FRAME 21	24"

2. THE CENTER VERTICAL KEEL IS CENTERED ON THE CENTERLINE OF THE SHIP.
3. MIDSHIPS IS 10'-2 FORWARD FRAME 81.
4. DIMENSIONS GIVEN FOR HULL STRUCTURAL WORK ARE FROM FRAME LINE UNLESS OTHERWISE NOTED.
5. DIMENSIONS LOCATING T-BAR AND I-BEAM SECTIONS ON TRANSVERSE BULKHEAD STRUCTURE ARE TO THE SIDE OF THE WEB NEAREST CENTERLINE OF SHIP FOR VERTICAL MEMBERS, AND TO THE UNDERSIDE OF THE WEB FOR HORIZONTAL MEMBERS UNLESS OTHERWISE NOTED.
6. MOLDED LINE OF ANGLE, FLANGE PLATE OR CHANNEL CUT TO ANGLE MEMBERS ARE TO THE HEEL SIDE OF SUCH MEMBERS UNLESS OTHERWISE NOTED.
7. MATERIAL THICKNESS OF SHELL IS OUTBOARD OF MOLDED LINE UNLESS OTHERWISE NOTED ON DETAIL DRAWING.
8. ALL PLATING TO BE FLUSH ON THE MOLDED SIDE.
9. THE MOLDED LINE OF INNERBOTTOM, DECKS AND FLATS IS TO THE UNDERSIDE OF PLATING UNLESS OTHERWISE NOTED.
10. THE MOLDED FRAME LINE IS ON THE FORWARD SIDE OF TRANSVERSE STRUCTURE FORWARD OF AND INCLUDING FRAME 109, AND AFT OF AND INCLUDING FRAME 57. THE MOLDED FRAME LINE IS ON THE AFTER SIDE OF TRANSVERSE STRUCTURE BETWEEN FRAMES 58-108 INCLUSIVE.
11. THE MOLDED LINE OF LONGITUDINAL BULKHEADS AND GIRDERS IS TO THE INBOARD SIDE UNLESS OTHERWISE NOTED.
12. THE MOLDED LINE OF T-BAR AND I-BEAM SECTIONS ON LONGITUDINAL BULKHEAD STRUCTURE IS TO THE UNDERSIDE OF HORIZONTAL MEMBERS UNLESS OTHERWISE NOTED.
13. THE 6/10 LENGTH AMIDSHIPS EXTENDS FROM FRAME 62.42 TO FRAME 100.59.
14. THE MOLDED LINE OF THE 39'-0-7/8 LONGITUDINAL BULKHEAD IS TO THE OUTBOARD SIDE.

HULL NO. 613 DWG NO. 0100-749 REV. G
SECTION II DIMENSIONS SHEET 6

K&E 19 1253 3-73 W-2607• MN 10-8½X11 (REV. 1)

SECTION III-MATERIAL

1. UNLESS OTHERWISE NOTED ON WORKING DRAWINGS, HULL STRUCTURAL MATERIAL SHALL BE ORDINARY STRENGTH GRADE "A" STEEL.
2. ALL HULL STRUCTURAL MATERIAL SHALL BE IN ACCORDANCE WITH CHEMICAL AND PHYSICAL PROPERTIES AS REQUIRED BY ABS RULES, SECTION 43, 1974 EDITION.
3. THE USE OF BUTT JOINTS IN HULL STRUCTURE IN ADDITION TO THOSE SHOWN ON THE WORKING DRAWINGS IS PERMITTED TO FACILITATE FABRICATION OR ERECTION, TO UTILIZE MATERIAL OR TO CORRECT FAULTY FIT UP. THE ADDED JOINTS SHALL BE LOCATED SO THAT THE RESULTING MAKE-UP PIECE OR MARGIN IS AT LEAST SIX INCHES WIDE. ALL SUCH JOINTS SHALL BE WELDED WITH 100% EFFICIENT BUTT TYPE JOINTS. (AS APPROVED BY OWNER'S LOCAL REPRESENTATIVE.)

   NOTE:

   THE ABOVE IN NO WAY AUTHORIZES THE USE OF A MAKE-UP PIECE OR MARGIN TO CORRECT MATERIAL MISALIGNMENT WHEREBY THE STRUCTURAL CONFIGURATION DOES NOT CONFORM TO THE WORKING DRAWING.

4. DHN MATERIAL MAY BE SUBSTITUTED FOR DH MATERIAL.

HULL NO. 613 DWG NO. 0100-749 REV. C
SECTION III MATERIAL SHEET 7

K&E 19 1253 3-73 W-2607• MN 10-8½X11 (REV. 1)

SECTION IV - PREPARATION OF MATERIAL

1. ALL PLATES AND SHAPES TO BE SHOT BLASTED AND COATED BY YARD, PRIOR TO FABRICATION, IN ACCORDANCE WITH REFERENCE NO. 5 AND 6.

HULL NO. 613 DWG NO. 0100-749 REV. A
SECTION IV-PREPARATION OF MATERIAL SHEET 8

K&E 19 1253 3-73 W-2607• MN 10-8½X11 (REV. 1)

SEPT. '80
6X

MICRO-MASTER 105 mm

0100-749

SECTION V - WELDING

1. ALL WELDING TO BE IN ACCORDANCE WITH REQUIREMENTS OF ABS RULES, SECTION 30, 1974 EDITION, NOTE NO. 2 AND NOTE NO. 8 BELOW.

2. WELDING SYMBOLS SHOWN ON THIS PLAN TO BE IN ACCORDANCE WITH REFERENCE NO. 3.

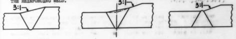
3. FILLET WELDS SHALL BE EXTENDED AROUND THE ENDS OF MEMBERS TO FORM CLOSED LOOPS WHEREVER PRACTICABLE.

4. WELDING OF BUTTS OR SEAMS IN PLATING COMPLETED BEFORE ASSEMBLY TO BE GROUND OR CHIPPED FLUSH IN WAY OF CROSSING MEMBERS.

5. AUTOMATIC AND SEMI-AUTOMATIC WELDING MAY BE USED IN LIEU OF MANUAL WELDING WHERE PRACTICABLE.

6. WHERE GIRDERS, BEAMS AND STIFFENERS ARE CUT FOR LEAVE-LOOSE PURPOSES OR OTHER REASONS, THEY ARE TO BE WELDED TOGETHER WITH A B2(S)V.2 JOINT OR A B2(S)V.4 JOINT SUBJECT TO THE REQUIREMENTS OF REFERENCE NO. 3, UNLESS OTHERWISE NOTED ON THE APPLICABLE PLAN.

7. WHEN WELDING PLATES OF DIFFERENT THICKNESSES, THE THICKER PLATE IS TO BE CHAMFERED AT 3:1 TAPER WHEN THE DIFFERENCE IS GREATER THAN 1/8". IN LIEU OF CHAMFERING THE THICKER PLATE, A TRANSITION BETWEEN THE PLATES NOT TO EXCEED 3:1 MAY BE MADE UP IN THE REINFORCING WELD.



8. WELDING TO BE IN ACCORDANCE WITH WELDING PROCEDURE, REFERENCE #4.

9. AT YARD DISCRETION, SINGLE BEVEL OR SINGLE "V" WELD JOINTS THAT ARE WELDED ON BOTH SIDES MAY HAVE THE BEVEL(S) ORIENTED TO FACE EITHER SIDE OF THE JOINT.

10. WHERE THE FOLLOWING SYMBOLS APPEAR ON THE WORKING DRAWINGS SUB-ARC WELDING IS TO BE USED:

SA - WELDED BOTH SIDES
SAT - ONE SIDE ONLY, TAPE BACKING
OSA - ONE SIDE ONLY, FLUX BACKING

11. WHERE THE OPENING BETWEEN MEMBERS EXCEEDS 1/16 AND IS NOT GREATER THAN 3/16 THE SIZE OF THE FILLETS IS TO BE INCREASED BY THE AMOUNT OF THE OPENING.

12. WHERE BEAMS, STIFFENERS, FRAMES, ETC., ARE INTERMITTENTLY WELDED THEY ARE TO HAVE A MATCHED PAIR OF INTERMITTENT WELDS AT EACH END. (SEE NOTE #17.)

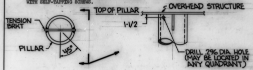
13. WHERE BEAMS, STIFFENERS, FRAMES, ETC., ARE INTERMITTENTLY WELDED & PASS THROUGH SLOTTED GIRDERS, SHELVES OR STRINGERS, THERE IS TO BE A MATCHED PAIR OF INTERMITTENT WELDS ON EACH SIDE OF SUCH INTERSECTION. (SEE NOTE #17.)

HULL NO. 613 | DWG NO. 0100-749 | REV. C
SECTION V-WELDING | SHEET 9

SECTION V - WELDING (CONTINUED)

14. INTERMITTENTLY WELDED LONGITUDINALS ARE TO HAVE DOUBLE CONTINUOUS WELDS AT ENDS EQUAL IN LENGTH TO DEPTH OF LONGITUDINAL. (SEE NOTE #18.)

15. CODE OF FEDERAL REGULATIONS, TITLE 29, CHAPTER XVII - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION INVOKED BY PUBLIC LAW 91-596 REQUIRES THAT SEALED TUBULAR PILLARS BE VENTED WHILE HOT WORK (WELDING, BURNING, ETC.) IS BEING PERFORMED ON THE EXTERIOR SURFACE. ACCORDINGLY, ALL TUBULAR PILLARS SHALL BE VENTED AS SHOWN BELOW. VENTS SHALL REMAIN OPEN UNTIL THE COMPARTMENT/SPACE IS OUTFITTED TO THE EXTENT THAT NO FURTHER HOT WORK IS NECESSARY. VENT OPENINGS SHALL THEN BE SEALED WITH SELF-TAPPING SCREWS.

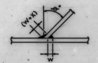


16. WHERE AUTOMATIC DOUBLE CONTINUOUS FILLET WELDING IS PROVIDED AND THE SPECIFIED SIZE OF FILLET WELD IS 1/4" OR GREATER, A REDUCTION IN FILLET SIZE OF 1/16" MAY BE USED PROVIDED THE OPENING BETWEEN MEMBERS DOES NOT EXCEED .04". THIS NOTE NOT APPLICABLE TO SLAB LONGITUDINALS.

17. WHERE BRACKETS ARE FITTED TO INTERMITTENTLY WELDED BEAMS, STIFFENERS, FRAMES, ETC. THERE SHALL BE DOUBLE CONTINUOUS WELDS AT THE ENDS OF THE MEMBERS EQUAL TO THE INCREMENT ON THE INTERMITTENT WELD OR TO THE LENGTH OF THE ATTACHED BRACKET, WHICH EVER IS GREATER.

18. WHERE BRACKETS ARE FITTED TO INTERMITTENTLY WELDED LONGITUDINALS THERE SHALL BE DOUBLE CONTINUOUS WELDS AT THE ENDS EQUAL IN LENGTH TO THE DEPTH OF THE LONGITUDINAL OR TO THE LENGTH OF THE BRACKET WHICH EVER IS GREATER.

HULL NO. 613 | DWG NO. 0100-749 | REV. C
SECTION V-WELDING (CONTINUED) | SHEET 10



W = DESIGN WELD ON DETAIL PLAN

θ°	X
0 THRU 10	0
OVER 10 THRU 20	1/16
OVER 20 THRU 45	1/8
OVER 45 USE DET 7-U. REF #7	—

19. THE ABOVE TABLE TO BE INVOKED FOR WELD JOINTS THAT DO NOT REQUIRE A FULL PENETRATION.

HULL NO. 613 | DWG NO. 0100-749 | REV. E
SECTION V-WELDING (CONTINUED) | SHEET 10A

SECTION VI - MISCELLANEOUS

1. CUTS FOR DOORS AND HATCHES ARE TO BE MADE FROM THE WORKING DRAWINGS AND CUT 3 INCHES SMALLER ALL AROUND INSIDE THE CLEAR DIMENSIONS.

NOTE: ALL MANHOLES AND SCUTTLES TO BE CUT TO FINISHED SIZE.

2. PLATES CUT FOR TEMPORARY ACCESS ARE TO BE STOWED ADJACENT TO THE OPENING AND WELDED BACK IN PLACE WHEN ACCESS IS NO LONGER REQUIRED. CUTS FOR TEMPORARY ACCESS OPENINGS ARE TO BE SHOWN ON WORKING DRAWINGS.

3. FLANGES OF SHELL, DECK AND BULKHEAD STIFFENERS SHALL NOT BE DRILLED OR PUNCHED FOR ATTACHMENTS OF GRATINGS, PLATFORMS, FOUNDATIONS, FITTINGS AND HANGERS. DRILLING AND/OR TAPPING HOLES FOR MOUNTING SMALL EQUIPMENT OR FITTINGS IS PERMISSIBLE IN PLATING OF NON-TIGHT OR FUME-TIGHT BULKHEADS, AND IN THE WEBS OF STRUCTURAL FRAMES. HOLES MAY BE DRILLED AND/OR TAPPED IN WEBS OF STIFFENERS, BEAMS, LONGITUDINALS, TRANSVERSES AND GIRDERS, ALSO IN THE STIFFENER FLANGES OF JOINER OR NON-STRUCTURAL BULKHEADS. SEE DETAIL B-B, PAGE 12.

4. THIS SYMBOL DENOTES A COLLAR WHERE STRUCTURAL SHAPES ARE CONTINUOUS THROUGH FLOORS, LONGITUDINALS, BULKHEADS, ETC.

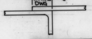
5. WHERE INSPECTION OF FABRICATED NON-TIGHT STRUCTURE DISCLOSES INSUFFICIENT DRAINAGE OR AIR OPENINGS, 1-1/2 INCH DIAMETER HOLES (IN ADDITION TO OPENINGS SHOWN ON APPLICABLE WORKING DRAWINGS) MAY BE CUT OR DRILLED AS NECESSARY IN WAY OF CORNER INTERSECTIONS. ADDED HOLES SHALL BE CUT AS CLOSE AS POSSIBLE TO THE INTERSECTION AND CLEAR OF ATTACHMENT WELDS. NO HOLES ARE PERMITTED IN THE FLANGES OF STRUCTURAL SHAPES.

6. THIS SYMBOL DENOTES A CUT-OUT WHERE STRUCTURAL SHAPES ARE CONTINUOUS THROUGH FLOORS, LONGITUDINALS, BULKHEADS, ETC.

7. CORNERS OF INTERCOSTAL PLATES AND SHAPES WHICH INTERFERE WITH FILLET WELDS OF CONTINUOUS STRUCTURE SHALL BE SNIPED 1/16 CLEAR OF FILLET AND SNIPE WILL BE WELDED THE SAME AS THE PERIPHERY OF THE INTERCOSTAL MEMBER.

8. NO HOLES SHALL BE CUT IN STRUCTURE EXCEPT AS SHOWN ON STRUCTURAL PLANS, DIAGRAMS OR AS SPECIFICALLY AUTHORIZED.

9. LAPPED PLATES AND SHAPES SHALL BE INSTALLED AS FOLLOWS:



HULL NO. 613 | DWG NO. 0100-749 | REV. B
SECTION VI - MISCELLANEOUS | SHEET 11

SECTION VI - MISCELLANEOUS

10. WATER STOPS TO BE ADDED AS REQUIRED IN WAY OF ALL WATER-TIGHT AND OIL-TIGHT BULKHEADS WHEN INTERSECTING WITH A WATER-TIGHT OR OIL-TIGHT MEMBER.

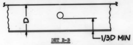
11. CUT 1-1/2 R HOLES IN WAY OF SHELL SEAMS FOR NON-TIGHT WEBS, FLOORS & BULKHEADS.

HULL NO. 613C | DWG NO. 0100-749 | REV. G
SECTION VI - MISCELLANEOUS | SHEET 11A

SECTION VI - MISCELLANEOUS (CONTINUED)

TEE-BAR SUBSTITUTION TABLE

BEAM SIZE (NOMINAL)	BUILT UP SIZE			
	DEPTH INCL FLG THK	FLG	WEB THK	FLG THK
30 X 10-1/2 X 116# I-T	30	10-1/2	9/16	7/8
24 X 12 X 100# I-T	24	12	7/16	3/4
24 X 9 X 94# I-T	24-1/4	9	1/2	7/8
24 X 9 X 84# I-T	24-1/8	9	1/2	3/4
24 X 9 X 76# I-T	23-7/8	9	7/16	11/16
21 X 8-1/4 X 73# I-T	21-1/4	8-1/4	7/16	3/4
21 X 8-1/4 X 68# I-T	21-1/8	8-1/4	7/16	11/16
21 X 8-1/4 X 62# I-T	21	8-1/4	3/8	5/8
18 X 8-3/4 X 64# I-T	17-7/8	8-3/4	3/8	11/16
18 X 7-1/2 X 60# I-T	18-1/4	7-1/2	7/16	11/16
18 X 7-1/2 X 55# I-T	18-1/8	7-1/2	3/8	5/8
18 X 7-1/2 X 50# I-T	18	7-1/2	3/8	9/16
16 X 7 X 50# I-T	16-1/4	7-1/8	3/8	5/8
16 X 7 X 45# I-T	16-1/8	7	3/8	9/16
16 X 7 X 40# I-T	16	7	5/16	1/2
16 X 7 X 36# I-T	15-7/8	7	5/16	7/16
14 X 6-3/4 X 38# I-T	14-1/8	6-3/4	5/16	1/2
14 X 6-3/4 X 34# I-T	14	6-3/4	5/16	7/16
24 X 12 X 110# I-T	24-1/8	12	1/2	7/8
18-X 8-3/4 X 70# I-T	18	8-3/4	7/16	3/4
14 X 8 X 53# I-T	14	8	3/8	11/16
14 X 6-3/4 X 30# I-T	13-7/8	6-3/4	1/4	3/8
14 X 8 X 43# I-T	13-5/8	8	5/16	1/2
30 X 10-1/2 X 132# I-T	30-1/4	10-1/2	5/8	1

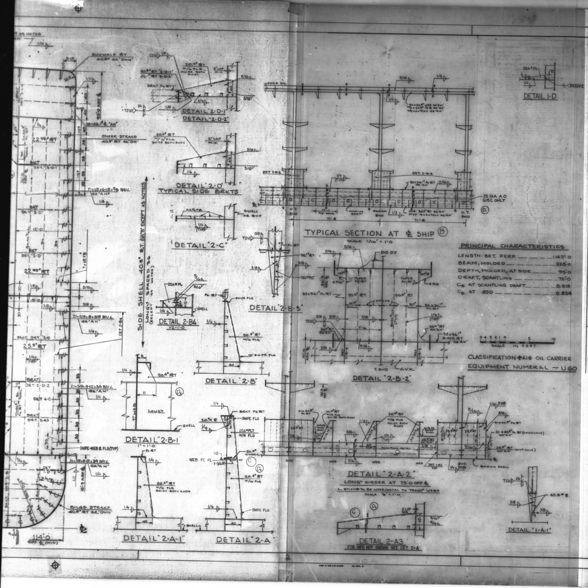


DET B-B

HULL NO. 613 | DWG NO. 0100-749 | REV. A
SECTION VI - MISCELLANEOUS (CONTINUED) | SHEET 12

SEPT. '80
6X

0100-749



PRINCIPAL CHARACTERISTICS

LENGTH BET. PERP.	1143'-0
BEAM, MOLDED	228'-0
DEPTH, MOLDED, AT SIDE	95'-0
DRAFT, SCANTLING	75'-0
C_B AT SCANTLING DRAFT	0.818
C_B AT .85D	0.824

CLASSIFICATION ✠A1® OIL CARRIER
EQUIPMENT NUMERAL ~ U60

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH'D	OWNER DATE	OWNER APP'D
B		5. DET 6-D1 CONFIGURATION OF DRAIN HOLES ALT TO EXTEND TO SHELL TO SUIT FABRICATION.				
		6. WEB AT MID-LENGTH OF TANK & WEB ADJACENT TO BHD: FLG OF SHELL & LONG. BHD WEBS SNIPED CLR TOP & BOTTOM TO SUIT OWNERS (SHELL) DET 2-B & 3-C2 ALT TO SUIT.				
		7. HORIZ GIRD #1 THRU 4: 6x3-1/2x1/2∠ STIF. ALT TO 8x9/16 FB & 9x4x9/16∠ ALT TO 10-1/2x3/4 FB TO SUIT OWNERS (ZAPATA). DET 10-A ADDED TO SUIT.				
		8. HORIZ GIRD #1 THRU 4: 18 DIA LIGHTENING HOLES DELETED & DRAIN HOLES ADDED				
		9. HORIZ GIRD #4: FC PL INBD OF BHD 39'-0-7/8 ALT FROM 20x40.8# PL TO 16x61.2# PL FOR OT & SWASH BHD. SECT 11-A ADDED TO SUIT DESIGN DEVELOPMENT.				
		10. HORIZ GIRD #4: 56.1# PL BRACKET ADDED AT FC PL OF CVK & GIRDER TO SUIT STRENGTH REQUIREMENTS.	RFC [illegible]	[illegible]	[illegible]	[illegible]
C		1. HORIZ GIRD #1 THRU 4: 18 DIA HOLES REINSTATED, DET 2-A & 2-A3: CUT-OUT FOR FC PL ALTERED TO HAVE RADIUS CORNERS, HORIZ GIRD #1, 3 & 4: DRAIN HOLE IN 39'-0 BHD LONG. AT INTERSECTION OF GIRDER BRKT RELOCATED. ALL TO SUIT OWNERS (ZAPATA) DATED 7-1-75				
		2. TRANSV OT BHD: HORIZ GIRD #1 & 3 INDICATION OF ML ALTERED TO BE TOP OF PL INBD OF LONG. BHD 39'-0-7/8 OFF CL OF SHIP.				
		3. HORIZ GIRD #1 THRU 4: CHOCKS ADDED TOPSIDE OF GIRD IN WAY OF BRACKETS ADJACENT TO FC PL RADIUS. DESIGN DEVELOPMENT TO SUIT STRENGTH REQUIREMENTS.				
		4. HORIZ GIRDER NO. 1, 3 & 4: 6x3 CUT OUT WITH 1-1/2R CORNERS ALTERED TO 6x3 FO & RELOCATED. DETAIL 6-D1: 10x6 CUT OUT ALT TO 10x6 FO. DET 6-D2 ALT TO SUIT. WELDING DESIGN DEVELOPMENT	RFC [illegible]	[illegible]	[illegible]	[illegible]
D	1C	1. TYP SECT AT ℄ SHIP: 25 DIA ACCESS OPNG NOTED 615 HULL ONLY				
	2A 5C 6C 10A	2. DET 2-A & 2-A3 BUTT IN BRKT ALT FROM ABV TO BELOW TRANSV FLG. IN TYP CUTS FOR LONG, 2 RAD DELETED & 2 DIA HOLE ADDED. DET 10-A 2 RAD SNIPES DELETED. ALL TO SUIT FABRICATION				
	2B	3. DET 2-B1 BOTTOM DIM OF CHOCK ALT FROM 12 TO 11 TO CLEAR FLG OF STIF.				
	9B	4. IN SWASH BHD 25x32 ACCESS ABV STGR #4 ALT TO STBD SIDE. 25x32 ACCESS ADDED ABV STGR #1 & 3.				
		5. BOTTOM LONG BHD STIF TOED UP TO CLEAR CARGO PIPING				
	3C 4C	6. TAPER ON FC PL OF BHD & SHELL WEBS AT TOP ALT FROM 12 ABOVE LONG TO 76'-0 ABOVE BL				
	12B	7. HORIZ STGR #4: 24x48 HATCHWAY ABT 9'-0 OFF ℄ PORT DELETED TO SUIT DEVELOPMENT OF ACCESS	RFC [illegible]	[illegible]	[illegible]	SHELL [illegible]

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH'D	OWNER DATE	OWNER APP'D
A	GEN	1. WELDING ADDED THRU OUT.				
	GEN	2. CONFIGURATION OF BRKT FLG AT END ALTERED THRU OUT				
	GEN	3. CONFIGURATION OF FOLLOWING DET ALT: 2-A; 2-A2; TYP SECT AT CL OF SHIP; TYP CUT FOR BOTTOM & BILGE LONG.; 3-C2; 4-A; TYP CUT FOR LONG. BUILT UP ANGLES; DOCKING BRKT; 6-B; 6-C; & 6-D.				
	11C	4. HORIZ STGR #1: LAP JOINTS ALT FROM 3" TO 2"; BUTTS ADDED 18 OFF ℄ PORT & AT MID PT BETW 39'-0 BHD & SHELL; 12x4x20.4# FLG PL AT 12'-0 OUTBD OF LONG. BHD & 12'-0 INBD OF SHELL ALT TO 12x4∠ CUT FROM 24x4x55.2# [; SNIPES ADDED TO 6x3-1/2x1/2∠ STIF; 16'-6 DIM. INBD OF LONG BHD ALT TO GO TO TAN. OF 30R; DRAIN HOLES INDICATED & ACCESS ADDED.				
	13A	5. HORIZ STGR #2: BUTTS ADDED IN PL 18 OFF ℄ PORT & AT MID PT BETW LONG. BHD & SHELL; SEAM ADDED 8'-0 OUTBD OF LONG. BHD & 8'-0 INBD OF SHELL; AO ALT TO SUIT; LONG. 9x4x9/16 ∠ STIF ALT TO BE CONT THRU WEB ADJ TO BHD & AT MID LENGTH OF TANK WEB; BUTT ADDED IN LONG. PORTION STGR AT 8'-11-1/2 FWD OF WEB ADJ TO BHD; 7x1/2 FB RELOC TO 9'-3 FWD OF WEB TO SUIT; SNIPES ADDED TO ENDS OF TRANSV & LONG. ∠ STIF; DRAIN HOLES INDICATED; 1ST TWO VERT BHD STIF INBD OF SHELL & OUTBD OF 39'-0 BHD MADE INTERCOSTAL TO STGR; ACCESS ADDED.				
	13C	6. HORIZ STGR #3: BUTTS ADDED 18 OFF ℄ PORT & AT MID PT BETW 39'-0 BHD & SHELL; 12x4x20.4# FLG PL ALT TO 12x4∠ CUT FROM 24x4x55.2# [AT 12'-0 OUTBD OF LONG. BHD & 12'-0 INBD OF SHELL; DRAIN HOLES INDICATED & ACCESS ADDED.				
	11A	7. HORIZ STGR #4: SEAM ADDED IN STGR 3" FWD OF BHD; BUTT ADDED AT MID PT BETW 39'-0 BHD & SHELL; 12x4x20.4# FLG PL AT 12'-0 OUTBD OF LONG. BHD & 12'-0 INBD OF SHELL ALT 12x4 ∠ CUT FROM 24x4x55.2# [; SNIPES ADDED TO ENDS OF 6x3-1/2x1/2∠ STIF; 16'-6 DIM. INBD OF LONG. BHD ALT TO GO TO TAN. OF 30R; DRAIN HOLES INDICATED; 40.8# PL BRKT BETW STGR & FC PL OF WEB ADJ TO BHD INCREASED IN LENGTH; FLG PL BRKT JUST OUTBD OF LONG. BHD & INBD OF SHELL AT WEB ADJ TO BHD ALT TO LAP IN LIEU OF FLUSH WITH GIRDER, & ACCESS ADDED.				
	9A	8. TRANSV OT BHD & CTR TK SWASH BHD: BUTTS ADDED ADJACENT TO ℄ PORT; ML OF 39'-0 BHD ALT TO OUTBD & 39'-0-7/8; 1ST VERT STIF OUTBD OF LONG. BHD & INBD OF SHELL FROM BOTTOM SHELL LONG TO STGR #2 ALT FROM 24x12x110# I-⊥ TO 24-1/8x1/2x12x7/8 B/U ⊥. HORIZ STIF OUTBD OF LONG BHD BLW STGR #4 ALT TO 8x4x1/2∠. FIRST HORIZ STIF BLW STGR #4 AT SHELL ALT TO 8x4x1/2∠. ACCESS ADDED ABV 15'-0 GIRDER IN SWASH BHD.				
	4A	9. WEB AT MID LENGTH OF TANK & WEB ADJACENT TO TRANSV BHD: BUTT ADDED 18 TO PORT IN LOWER WEB; BUTT ADDED AT MID PT OF WEB BETW LONG. BHD & SHELL; LONG. STIF ON HORIZ STGR #2 IWO 39'-0 BHD ALT TO TOE OUTBD & STIF IWO STGR #2 AT SHELL ALT TO TOE INBD; CUT-OUT IWO LONG. GIRD 75'-0 OFF CL ALT; BUTTS IN UPPER TRANSV GIRD MADE TO BE NORMAL TO MN DK; SNIPES ADDED TO VERT STIF; COLLARS IWO INBD BRKT AT LONG. BHD ALT; CUT-OUTS & COLLARS ON SHELL LONG. BETW 15'-0 STGR & 30'-3 STGR ALT; DET 4-C ADDED; HORIZ FB BETW SHELL LONG & VERT STIF BLW 48'-0 STGR ALT TO PL BRKT; DET 2-B4 ADDED; HALF WIDTH OF KEEL PL ALT FROM 59 TO 58-1/2; LONG. BHD SIDE SHELL & BOTTOM SHELL LONG. ALT FROM FLG PL & I-⊥ RESPECTIVELY TO BUILT UP ∠s & ⊥s; ACCESS OPNG 94'-6 OFF CL RELOC TO 91'-6 OFF CL IN WEB ADJACENT TO BHD.				
	GEN	10. SCANTLINGS OF TYP VERT STIF ALT FROM I-⊥ TO BUILT-UP TEES.				
		11. FOLLOWING DET ADDED 1-A1; 1-D; 2-A3; 6-D1				
		INITIAL ISSUE	GRD RFC	[illegible]	3-13-75 4-11-75	(SHELL) (ZAPATA)
B		1. TYP SECT AT CL SHIP; WEB AT MID-LENGTH OF TANK; WEB ADJACENT TO TRANSV BHD: ALL HOLES ALT TO 25 DIA IN LIEU OF 15x23 & 24 DIA. SWASH BHD: 24x32 AO ABV 15'-0 FLAT ALT TO 25x32. ALL TO FACILITATE HANDLING OF INJURED PERSONNEL TO SUIT OWNERS REQUEST.				
		2. SWASH BHD: 25x32 AO NOTED TO BE PORT ONLY. LADDER RUNGS & HAND GRAB RELOC FROM OPNG IN 3RD BAY TO OPNG IN 6TH BAY TO SUIT ACCESS.				
		3. DOCKING BRKT: TOP OF STBD BRKT ALT FROM 3 TO 1 TO SUIT OWNERS LTR DTD 3-13-75 (SHELL)				
		4. ALL 3/16 FILLET WELDS INCREASED TO 1/4 IN CARGO AREA. WELD OF WEB AT MID-LENGTH OF TK TO HORIZ STRG #2 AT 39'-0-7/8 BHD & SHELL ALT FROM 1/4 TO 5/16 ABV & FROM 5/16 TO 3/8 BELOW. WELD OF WEB ADJACENT TO BHD TO HORIZ WEB NO. 2 AT SHELL & BHD 39'-0-7/8 ALT FROM 1/4 TO 1/4/5/16 ABV. ALL TO SUIT ABS LTR DTD 3-20-75				

(CONTINUED AT LEFT)

NO.	REFERENCES	DWG NO.

AUTHORITY:

GENERAL NOTES:

1. ALL MATERIAL IS TO BE A.B.S. GRADE "A" UNLESS SPECIFIED OTHERWISE.
2. A.B.S. HTS STEEL IS GRADE 36.
3. THIS PLAN DEVELOPED FROM ABS APPROVED MIDSHIP SECT DWG NO. 268488 FOR PD 1040.

DWG. REV — HULL APPLIC.

REV	[illegible]	[illegible]	[illegible]			
A	YES	YES	YES			
B	YES	YES	YES			
C	YES	YES	YES			
D	YES	YES	YES			

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS 3-13-75 (SHELL) 4-11-75 (ZAPATA)	ABS 3-20-75 "B" "C" 10-24-75 "D" 3-30-77
	USCG 4-24-75 "D" 5-6-77

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
HULL DESIGN DIV.
FSCM NO. 43689
STRUCTURAL DEPT.

SCALE 1/4 & AS NOTED = 1 FT
DRAWN G R DEANE
CHECKED R.F. CARMINE
SECT MGR 10/29/74
DATE COMPL. 10-29-74
EXAMINED
AUTHORIZED
DATE 10-30-74
TECH APPROVAL 2-14-75 2-14-75
CSD APPROVAL

390,000 DWT ULCC
MIDSHIP SECTION &
TRANSVERSE BULKHEAD

USMA DESIGN
~~USMA DWG NO.~~ ~~HULL NO.~~

DWG NO. 0100-755
REV D
SHEET NO. 1 OF 1

0100-755

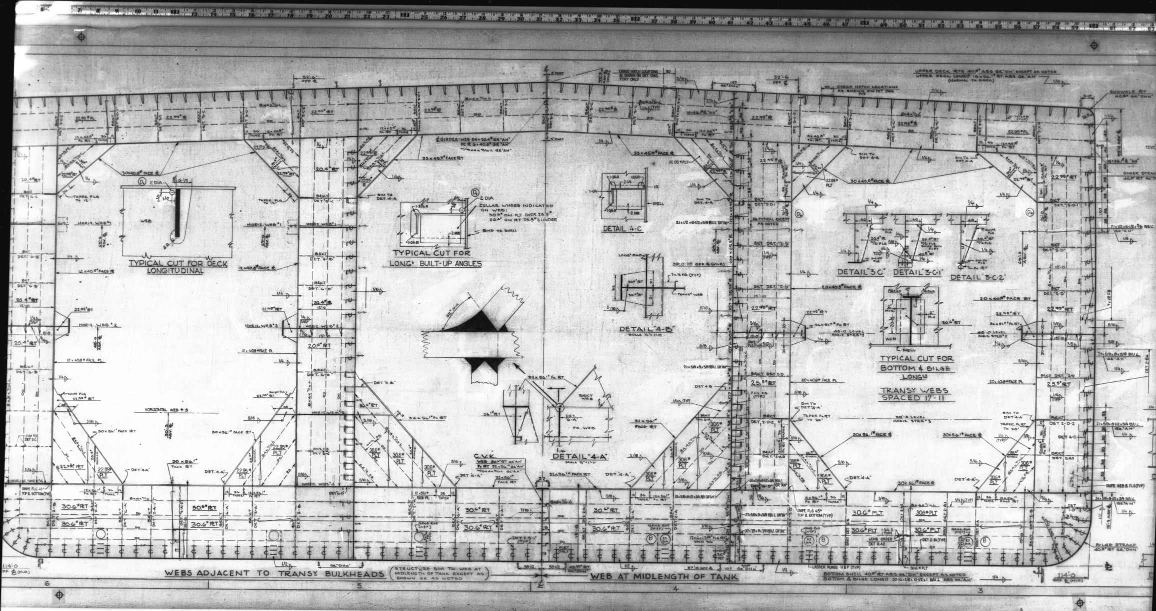
REPRODUCTION OFFICE

GROUP:
MC NO.

0100-755

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 1
10X


TYPICAL CUT FOR DECK LONGITUDINAL
TYPICAL CUT FOR LONG'L BUILT-UP ANGLES
COLLAR WHERE INDICATED ON WEB: 30.6# ON PLT OVER 25.5# 20.4# ON PLT 25.5# & UNDER
DETAIL 4-C
DETAIL "4-B"
DETAIL "4-A"
DETAIL "3-C"
DETAIL "3-C-1"
DETAIL "3-C-2"
TYPICAL CUT FOR BOTTOM & BILGE LONG'LS
TRANS'V WEBS SPACED 17'-11
C.V.K.
WEBS ADJACENT TO TRANS'V BULKHEADS
(STRUCTURE SIM TO WEB AT MIDLENGTH OF TANK EXCEPT AS SHOWN OR AS NOTED)
WEB AT MIDLENGTH OF TANK
UPPER DECK PLTG 40.8# ABS GR "DH" EXCEPT AS NOTED
UPPER DECK LONG'LS 15 x 56.1# PLT ABS GR "AH" (NORMAL TO DECK)
CARGO HATCH LOCATIONS AS SHOWN ON DET DWG
GUNWALE PLT 40.8# GR "DH"
SHEER STRAKE 40.8# PLT GR "DH"
BILGE STRAKE 40.8# PLT GR "DH"
BOTTOM SHELL 40.8# PLT ABS GR "DH" EXCEPT AS NOTED
BOTTOM & BILGE LONG'LS 30 1/4 x 5/8 x 10 1/2 x 1 B/U L ABS GR "AH"
114'-0 OFF ℄ (MLD)
6
5
4
3

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MICRO-MASTER 105 mm

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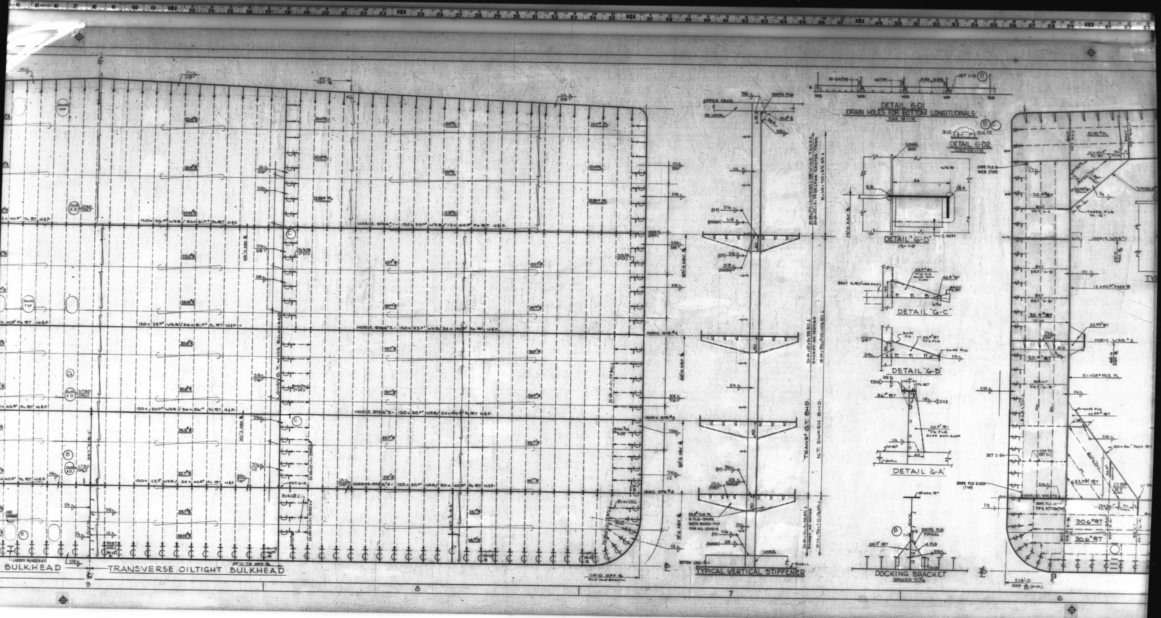
FRAME 2


DETAIL 6-D1
DRAIN HOLES FOR BOTTOM LONGITUDINALS
SCALE 1/8"=1'-0"
DETAIL 6-D2
DETAIL "6-D"
DETAIL "6-C"
DETAIL "6-B"
DETAIL "6-A"
DOCKING BRACKET
SPACED 7'1⅜
TYPICAL VERTICAL STIFFENER
TRANSV O.T. BHD.
N.T. SWASH BHD.
LONG'L O.T. WING BULKHEAD
BULKHEAD
TRANSVERSE OILTIGHT BULKHEAD
HORIZ. STRG #1 - 120 x 20.4# WEB / 12 x 40.8# FC PLT
HORIZ. STRG #2 - 120 x 25.5# WEB / 24 x 40.8# FC PLT
HORIZ. STRG #3 - 120 x 20.4# WEB / 24 x 40.8# FC PLT
HORIZ. STRG #4 - 120 x 20.4# WEB / 30 x 40.8# FC PLT
HORIZ. STR #1
HORIZ. STR #2
HORIZ. STR #3
HORIZ. STR #4
UPPER DECK
BOTTOM LONG'L
SHELL
CHOCK
114'-0 OFF ℄
MLD HALF BREADTH
39'-0 7/8 OFF ℄
LADDER RUNGS (N.S.F.)
9
8
7
6

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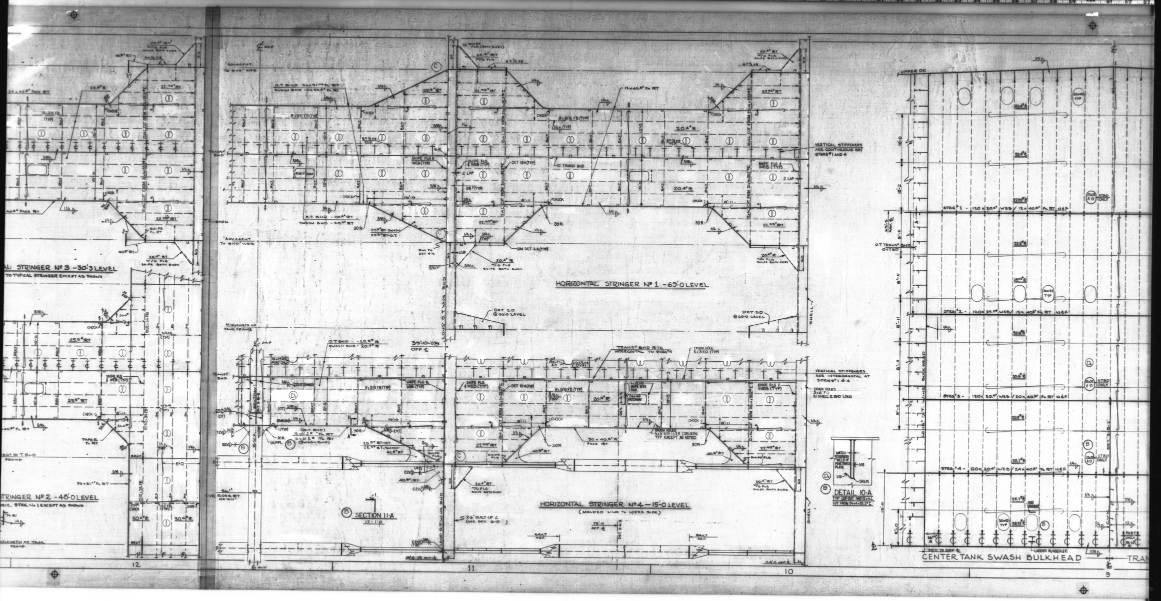
FRAME 3


AL STRINGER No 3 - 30'-3 LEVEL
TO TYPICAL STRINGER EXCEPT AS SHOWN
TRINGER No 2 - 48'-0 LEVEL
HORIZONTAL STRINGER No 1 - 69'-0 LEVEL
HORIZONTAL STRINGER No 4 - 15'-0 LEVEL
(MOLDED LINE TO UPPER SIDE)
SECTION 11-A
1/2 - 1'-0
DETAIL 10-A
CENTER TANK SWASH BULKHEAD
VERTICAL STIFFENERS ARE CONTINUOUS BET STRGS #1 AND 4
VERTICAL STIFFENERS ARE INTERCOASTAL AT STRGS #1 & 4
DRAIN HOLES 3x6 FO IN SHELL & BHD LONG
STRG #1 - 120 x 20.4# WEB / 12 x 40.8# FL RT N&F
STRG #2 - 120 x 25.5# WEB / 15 x 40.8# FL RT N&F
STRG #3 - 120 x 20.4# WEB / 20 x 40.8# FL RT N&F
STRG #4 - 120 x 20.4# WEB / 24 x 40.8# FL RT N&F
UPPER DK
O.T. TRANSV BHD
SHELL
12
11
10
9

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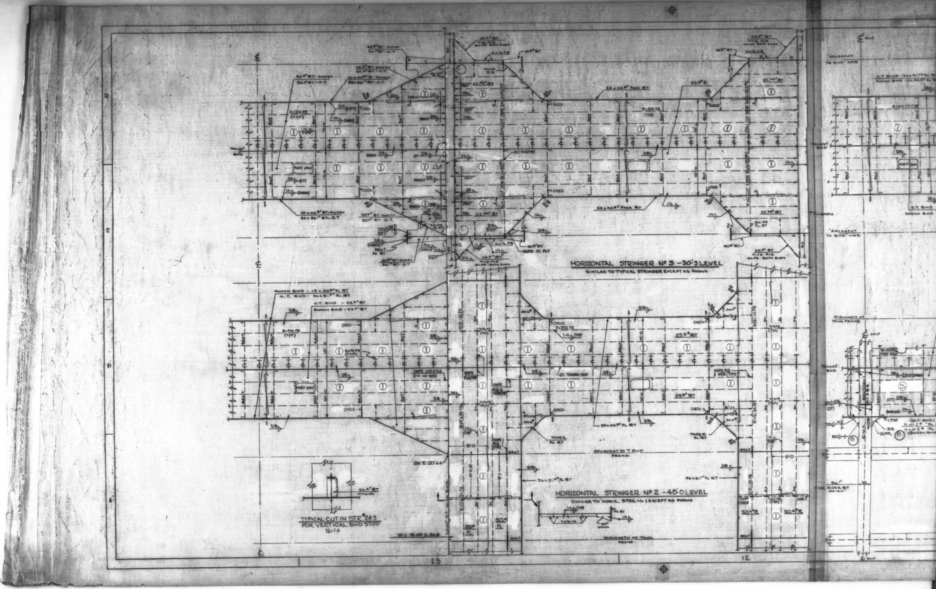
FRAME 4


HORIZONTAL STRINGER No 3 - 30'-3 LEVEL
SIMILAR TO TYPICAL STRINGER EXCEPT AS SHOWN
HORIZONTAL STRINGER No 2 - 48'-0 LEVEL
SIMILAR TO HORIZ. STRG. No 1 EXCEPT AS SHOWN
TYPICAL CUT IN STR. # 2 & 3
FOR VERTICAL BHD STIFF
1/2 = 1'-0
20.4# RT COLLAR
SIM TO DET 4-A
ADJACENT TO T. BHD FRAME
MIDLENGTH OF TANK FRAME
36 x 51.0# Fc RT
39'-0-7/8 OFF CL (MLD)
24 x 40.8# FACE RT
25.5# RT
PORT ONLY
CHOCK
SWASH BHD - 15 x 40.8# Fc RT
O.T. BHD - 36 x 51.0# Fc RT
O.T. BHD - 25.5# RT
SWASH BHD - 25.5# RT
TAPER Fc RT
SNIPE FLG & WEB (TYP)
O.T. TRANSV BHD
1/4 (TYP)
30.6# PL
20.4# CHOCK
A
B
C
D
13
12

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APPROVED BY U.S.C.G. LTR. 16710/NNS & DD/ HULLS 613-614, SER: 6621/018-04, DTD. 30 JANUARY 1979
INTERIM LOADING MANUAL APPROVED BY A.B.S. LTR. T-8-2 DTD. 15 FEBUARY 1979

TRIM AND STABILITY BOOKLET

390,000 DWT. BULK OIL CARRIER

U.S.T. ATLANTIC

OFFICIAL NO. 601437

OWNER
UNITED STATES TRUST
COMPANY of NEW YORK

BUILDER
NEWPORT NEWS SHIPBUILDING, NEWPORT NEWS, VA.

BUILDER'S HULL NO. 613C
MARAD HULL NO. 309

N.N.S. PLAN NO. 0100-758
REV. C

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REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D	OWNER DATE	OWNER APP'D.
A		INITIAL ISSUE	10/27/78 CJG			
B	2	INDEX REVISED TO SUIT THE NEW TITLES OF CONDITIONS NO. 10 & 11.				
	6	DEADWEIGHT, AND GROSS AND NET TONNAGE ADDED.				
	7	DEADWEIGHT REVISED TO SUIT DEADWEIGHT DETERMINATION.				
	9	DATE OF DEADWEIGHT DETERMINATION ADDED.				
	14	SPELLING ERROR CORRECTED.				
	18	FREE SURFACE VALUES FOR THE CARGO TANKS REVISED FOR CHANGE IN DENSITY.				
	22,23	GRAPH OF HYDROSTATIC DATA ~ DEADWEIGHT COLUMN ADDED.				
	24,25 & 26	SUMMARY OF LOADING CONDITIONS REVISED TO SUIT PAGES 29-50.				
	28	BLANK CALCULATION FORM ~ LIGHT SHIP DATA AND FREE SURFACE VALUES FOR MISCELLANEOUS DEADWEIGHT ITEMS ADDED.				
	GEN.	PAGES 29-50, LOADING CONDITION 1 THROUGH NO. 11, REVISED TO SUIT DEADWEIGHT DETERMINATION. LOADING CONDITIONS NO. 10 & 11 CHANGED TO SUIT OWNER'S REQUEST.	1/10/79 CJG	Jdt	1-16-79	
C	41-48	CONDITIONS NOS. 7, 8, 9, 10 REVISED TO SUIT OUTPUT OF THE LOADING COMPUTER.				
	25	SUMMARY OF LOADING CONDITIONS REVISED.				
		APPROVED BY USCG LTR 16710/NNS & DD HULL 613 SER: 170-03 DTD 25 JUNE 1979.	4/4/79 CJG	Jdt	6-11-79	

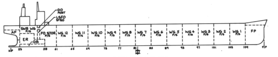
REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D	OWNER DATE	OWNER APP'D.

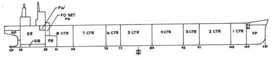
NEWPORT NEWS SHIPBUILDING

DATE 1-15-79
AUTHORIZED R. L. Harrington
NAVAL ARCHITECT

N.N.S. PLAN NO. 0100-758
BUILDER'S HULL NO. 613C



OUTBOARD PROFILE



INBOARD PROFILE

GENERAL DATA

LENGTH OVERALL	1187 FT - 11 11/16 IN
LENGTH BETWEEN PERPENDICULARS	1143 FT - 0 IN
BEAM, MLD	228 FT - 0 IN
DEPTH, MLD TO UPPER DECK AT SIDE	95 FT - 0 IN
DEPTH, MLD TO UPPER DECK AT C.L.	99 FT - 4 IN
DESIGN DRAFT, MLD	74 FT - 0 IN
DESIGN DRAFT, KEEL	74 FT - 1 1/16 IN
DESIGN DISPLACEMENT, TOTAL, S.W.	450684 LT
DEADWEIGHT CORRESPONDING TO DESIGN DISPL, S.W.	391844 LT
INTERNATIONAL SUMMER DRAFT, KEEL, S.W.	75 FT - 0 5/16 IN
INTERNATIONAL TANKER SUMMER FREEBOARD	20 FT - 1 3/4 IN
DISPLACEMENT AT SUMMER DRAFT, S.W.	456983 LT
DEADWEIGHT AT SUMMER DRAFT, S. W.	398143 LT
LIGHT SHIP WEIGHT	58840 LT
LIGHT SHIP VERTICAL CENTER OF GRAVITY ABV B.L.	66.50 FT
LIGHT SHIP LONGL CENTER OF GRAVITY AFT F.P.	604.53 FT
CARGO CAPACITY, 98% FULL	3000147 BBLS
GROSS REGISTER TONNAGE	189416.92
NET REGISTER TONNAGE	171126.00

PROPELLER IS IMMERSED AT 38 FT-3 IN KEEL DRAFT

RADIO CALL LETTERS	WHNH

PROPELLING MACHINERY

BOILERS	2 - WATERTUBE C.E. 850# G. 950°F
TURBINES	GENERAL ELECTRIC, 45000 ABS RATED SHP, 85 RPM
REDUCTION GEARS	GENERAL ELECTRIC
PROPELLER	1 - 6 BLADED NICKEL-ALUMINUM-BRONZE, 31 FT-6IN DIA, 19.341 FT PITCH AT .7 RADIUS
DESIGN SERVICE SPEED (CLEAN HULL)	15.9 KNOTS AT ABS POWER AND DESIGN DRAFT

PUMPS

MAIN CARGO PUMPS CAPACITY (EACH)	4-TURBINE DRIVEN, HORIZONTAL-CENTRIFUGAL, 22500 GPM, RATED TOTAL HEAD 200 PSIG, EQUIPPED WITH WORTHINGTON VAC-STRIP SYSTEM
BILGE AND STRIPPING PUMP CAPACITY	1-VERTICAL DUPLEX DOUBLE ACTING RECIPRICATING - 1200 GPM, 200 PSIG DISCHARGE PRESSURE
BALLAST PUMP CAPACITY	1-TURBINE DRIVEN, HORIZONTAL CENTRIFUGAL - 22500 GPM, RATED TOTAL HEAD 100 FEET, EQUIPPED WITH WORTHINGTON VAC-STRIP SYSTEM
BILGE AND BALLAST PUMPS CAPACITY (EACH)	2-HORIZONTAL CENTRIFUGAL 885 GPM, RATED TOTAL HEAD 115 FEET

INTERNATIONAL FREEBOARD, DRAFT & DEADWEIGHT DATA

SUMMER

MOLDED DEPTH AMIDSHIPS TO UPPER DECK AT SIDE	95'-0"	
THICKNESS OF UPPER DECK STRINGER PLATE AMIDSHIPS	0'-1"	
TOTAL	95'-1"	
SUMMER FREEBOARD ASSIGNED BY A.B.S.	20'-1 3/4"	
MOLDED DRAFT TO SUMMER FREEBOARD LINE	74'-11 1/4"	
BOTTOM OF KEEL BELOW MOLDED BASE LINE	0'-1 1/16"	
SUMMER DRAFT, KEEL	75'-0 5/16"	
CORRESPONDING DISPLACEMENT, SEA WATER	456983	L.T.
CORRESPONDING DEADWEIGHT	398143	L.T.

FRESH WATER

FRESH WATER FREEBOARD ASSIGNED BY A.B.S.	18'-5 3/8"	
MOLDED DRAFT TO FRESH WATER FREEBOARD LINE	76'-7 5/8"	
BOTTOM OF KEEL BELOW MOLDED BASE LINE	0'-1 1/16"	
FRESH WATER DRAFT, KEEL	76'-8 11/16"	
CORRESPONDING DISPLACEMENT, FRESH WATER	455362	L.T.
CORRESPONDING DEADWEIGHT	396522	L.T.

TROPICAL

TROPICAL FREEBOARD ASSIGNED BY A.B.S	18'-7"	
MOLDED DRAFT TO TROPICAL FREEBOARD LINE	76'-6"	
BOTTOM OF KEEL BELOW MOLDED BASE LINE	0'-1 1/16"	
TROPICAL DRAFT, KEEL	76'-7 1/16"	
CORRESPONDING DISPLACEMENT, SEA WATER	467464	L.T.
CORRESPONDING DEADWEIGHT	408624	L.T.

TROPICAL FRESH WATER

TROPICAL F.W. FREEBOARD ASSIGNED BY A.B.S.	16'-10 5/8"	
MOLDED DRAFT TO TROPICAL F.W. FREEBOARD LINE	78'-2 3/8"	
BOTTOM OF KEEL BELOW MOLDED BASE LINE	0'-1 1/16"	
TROPICAL FRESH WATER DRAFT, KEEL	78'-3 7/16"	
CORRESPONDING DISPLACEMENT, TROPICAL F.W.	465579	L.T.
CORRESPONDING DEADWEIGHT	406739	L.T.

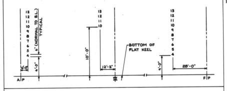
WINTER

WINTER FREEBOARD ASSIGNED BY A.B.S.	21'-8 1/2"	
MOLDED DRAFT TO WINTER FREEBOARD LINE	73'-4 1/2"	
BOTTOM OF KEEL BELOW MOLDED BASE LINE	0'-1 1/16"	
WINTER DRAFT, KEEL	73'-5 9/16"	
CORRESPONDING DISPLACEMENT, SEA WATER	446529	L.T.
CORRESPONDING DEADWEIGHT	387689	L.T.

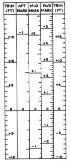
WINTER, NORTH ATLANTIC

W.N.A. FREEBOARD ASSIGNED BY A.B.S.	N/A	
MOLDED DRAFT TO W.N.A. FREEBOARD LINE	N/A	
BOTTOM OF KEEL BELOW MOLDED BASE LINE	N/A	
WINTER NORTH ATLANTIC DRAFT, KEEL	N/A	
CORRESPONDING DISPLACEMENT, SEA WATER	N/A	L.T.
CORRESPONDING DEADWEIGHT	N/A	L.T.

DRAFT MARK LOCATIONS



CORRECTION (IN INCHES) TO DRAFTS AT FP, ⊠, & AP



INSTRUCTIONS FOR COMPUTING DRAFTS AT DRAFT MARKS

1. PLACE A STRAIGHT EDGE (SUCH AS A TRIANGLE) HORIZONTALLY ACROSS GRAPH AT RIGHT SUCH THAT THE VESSEL'S TRIM BETWEEN PERPENDICULARS (+ AFT, - FWD) IS READ ON BOTH TRIM SCALES.
2. WHERE THE STRAIGHT EDGE INTERSECTS THE AFT, MID, AND FWD DRAFT MARK SCALES, READ THE CORRECTIONS TO BE ADDED TO THE DRAFTS AT AP, ⊠, AND FP, RESPECTIVELY.

EXAMPLE

GIVEN CALCULATED DRAFTS AT AP, ⊠, AND FP, WITH TRIM BETWEEN PERPENDICULARS EQUAL TO 8.0 FEET BY THE STERN, FIND DRAFTS AT FWD, MIDSHIP, AND AFT DRAFT MARKS.

	AFT	MIDSHIP	FWD
DRAFT AT PERPENDICULAR	44'-0"	40'-0"	36'-0"
+ CORRECTION (FROM GRAPH)	- 0'-0 1/2"	+ 0'-1"	+ 0'-2 3/8"
DRAFT AT DRAFT MARK	43'-11 1/2"	40'-1"	36'-2 3/8"

GENERAL NOTES

1. THE ACCOMPANYING DATA HAS BEEN PREPARED TO PERMIT A QUICK AND RELIABLE ESTIMATE OF THE TRIM, STABILITY, DRAFTS, ETC., OF THE SHIP UNDER VARIOUS LOADING CONDITIONS.

2. THE DATA CONTAINED HEREIN, IN CONJUNCTION WITH OTHER DATA FURNISHED THE VESSEL, WILL PROVIDE THE MASTER WITH SUFFICIENT INFORMATION TO DETERMINE THE AVAILABLE GM AND FREEBOARD FOR ANY CONDITION OF LOADING OR OPERATION OF THE VESSEL.

3. THE CALCULATIONS FOR DETERMINING THE ESTIMATED DRAFTS ARE BASED ON THE RESULTS OF A LIGHT SHIP WEIGHT CHECK FOR THIS VESSEL CONDUCTED ON NOVEMBER 1, 1978, UNDER THE SUPERVISION OF THE UNITED STATES COAST GUARD.

4. THE VESSEL HAS BEEN REVIEWED FOR DAMAGE STABILITY ASSUMING THE FOLLOWING EXTENT OF DAMAGE:

   A) LONGITUDINAL EXTENT

   ONE COMPARTMENT DAMAGE OCCURRING ANYWHERE ALONG THE VESSEL'S LENGTH, OR TWO COMPARTMENT DAMAGE OCCURRING ANYWHERE WITHIN THE CARGO LENGTH.

   B) TRANSVERSE EXTENT

   DAMAGE EXTENDING INBOARD A DISTANCE OF 45.6 FEET MEASURED FROM THE SIDE OF THE SHIP PERPENDICULARLY TO THE CENTERLINE AT THE LEVEL OF THE SUMMER LOAD WATERLINE.

   C) VERTICAL EXTENT
   DAMAGE EXTENDING FROM THE BASELINE UPWARDS WITHOUT LIMIT.

   WITH THESE ASSUMPTIONS, THE VESSEL HAS BEEN FOUND TO REMAIN AFLOAT IN A SATISFACTORY CONDITION OF EQUILIBRIUM.

5. "SLACK" TANKS ARE DEFINED AS FOLLOWS:

   A) CARGO TANKS WHICH ARE NOT EMPTY BUT WHICH ARE FILLED TO LESS THAN 98% OF THE TANK VOLUME.

   B) SALT WATER BALLAST TANKS WHICH ARE NEITHER EMPTY NOR PRESSED-UP.

   C) CONSUMABLE LIQUID TANKS WHICH ARE NEITHER EMPTY NOR PRESSED-UP.

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GENERAL NOTES (CONT'D)

6. DRAFTS HEREIN REFERRED TO AS MEAN, FWD, AND AFT ARE DRAFTS AT MIDSHIP, FOREWARD PERPENDICULAR, AND AFTER PERPENDICULAR, RESPECTIVELY. GENERALLY, IT IS SUFFICIENTLY ACCURATE TO ASSUME THAT THESE LOCATIONS COINCIDE WITH THE DRAFT MARKS. HOWEVER, IF GREATER ACCURACY IS DESIRED, DRAFTS AT THE DRAFT MARKS MAY BE COMPUTED USING THE CORRECTIONS GIVEN ON PAGE 8.

7. ALL TONS HEREIN ARE LONG TONS OF 2240 LBS.

OPERATING INSTRUCTIONS

1. NO CARGO TANK SHALL BE LOADED TO MORE THAN 98% OF THE TANK VOLUME (SEE PAGE 16).

2. AT DRAFTS GREATER THAN 65 FEET, THE VESSEL SHALL NOT BE OPERATED WITH A TRIM BETWEEN PERPENDICULARS EXCEEDING 10 FEET, EITHER BY THE BOW OR BY THE STERN. AT DRAFTS OF 65 FEET OR LESS, TRIMS NOT EXCEEDING 10 FEET BY THE BOW OR 20 FEET BY THE STERN MAY BE PERMITTED.

3. ALL UPPER DECK HATCHES, MANHOLES, SCUTTLES, AND WEATHER DOORS SHALL BE KEPT CLOSED AND FULLY SECURED AT ALL TIMES WHEN UNDERWAY, EXCEPT WHEN ACTUALLY USED FOR TRANSIT UNDER SAFE CONDITIONS.

4. ALL BOLTED WATERTIGHT MANHOLE COVERS THROUGHOUT THE SHIP SHALL BE KEPT CLOSED AND FULLY SECURED EXCEPT WHEN ACTUALLY IN USE UNDER SAFE CONDITIONS.

5. ALL VALVES IN THE CARGO AND BALLAST SYSTEMS SHALL BE KEPT CLOSED AT ALL TIMES EXCEPT WHEN ACTUALLY IN USE DURING LOADING OR BALLASTING OPERATIONS.

6. CROSS CONNECTIONS BETWEEN PORT AND STARBOARD FUEL OIL STORAGE AND SETTLING TANKS SHALL BE KEPT CLOSED AT ALL TIMES EXCEPT WHEN ACTUALLY IN USE FOR TRANSFER OF FUEL OIL.

7. BILGES NOT BEING UTILIZED AS TANKAGE SHALL BE KEPT PUMPED TO MINIMUM CONTENT AT ALL TIMES.

8. SYMMETRICAL TANK PAIRS SHALL BE KEPT FILLED TO APPROXIMATELY THE SAME LEVEL PORT AND STARBOARD TO ELIMINATE LIST.

9. THE NUMBER OF SLACK CARGO AND BALLAST TANKS SHALL BE KEPT TO A MINIMUM CONSISTENT WITH OPERATIONAL REQUIREMENTS.

10. DURING BALLASTING OR DEBALLASTING, AND DURING LOADING OR UNLOADING OF CARGO, A REDUCTION IN THE VESSEL'S GM WILL OCCUR DUE TO SLACK TANK FREE SURFACE UNTIL THE TANK IS PRESSED UP OR EMPTY. THIS TEMPORARY LOSS OF GM (IN FEET) IS EQUAL TO THE SLACK FREE SURFACE MOMENT OF THE TANK DIVIDED BY THE VESSEL'S DISPLACEMENT (IN LONG TONS). SEE PAGE 18 FOR FREE SURFACE MOMENTS.

11. CARE SHOULD BE TAKEN TO ASSURE THAT THE VESSEL WILL HAVE AT LEAST TWO INCHES OF POSITIVE GM DURING LOADING OR UNLOADING OPERATIONS WHILE IN PORT. SEE INSTRUCTION NO. 10.

12. IN SEA-GOING CONDITIONS, THE VESSEL'S GM SHALL BE EQUAL TO OR GREATER THAN THE GM REQUIRED AS READ FROM THE CURVE OF GM REQUIRED ON PAGE 20.

OPERATING INSTRUCTIONS (CONT'D)

13. IN THE EVENT OF DAMAGE TO THE VESSEL WHICH MAY RESULT IN FLOODING, THE FOLLOWING ACTIONS SHOULD BE TAKEN IMMEDIATELY:

    A) VERIFY THAT ALL OPENINGS SPECIFIED IN INSTRUCTION NO. 3 ARE CLOSED AND FULLY SECURED, AND IN ADDITION, CLOSE AND SECURE ALL VENTS AND ANY OTHER OPENINGS ON UPPER DECK WHICH ARE PROVIDED WITH COVERS, DOORS, OR OTHER MEANS OF BEING MADE WATERTIGHT OR WEATHERTIGHT.

    B) VERIFY THAT ALL VALVES SPECIFIED IN INSTRUCTIONS 5 AND 6 ARE FULLY CLOSED.

PROCEDURE FOR CALCULATION

LOADING TABLE AND TRIM & STABILITY CALCULATIONS, PAGE 28:

1. FOR EACH LOADED SPACE ON THE VESSEL, ENTER WEIGHT (IN LONG TONS) IN COLUMN (B). SEE PAGES 16 AND 17.

2. THE LOADED VESSEL'S DISPLACEMENT IS OBTAINED BY ADDING THE ENTRIES IN COLUMN (B) ON LINES 1 THRU 34. ENTER THE SUM ON LINES 35 AND 36.

3. FOR EACH LOADED SPACE, THE APPROPRIATE VALUE FOR THE DISTANCE OF ITS LONGITUDINAL CENTER OF GRAVITY (LCG) FROM THE FOREWARD PERPENDICULAR IS GIVEN IN COLUMN (C). MULTIPLY EACH ENTRY IN COLUMN (B) BY THE NUMBER IN COLUMN (C) AND ENTER THE PRODUCT IN COLUMN (D).

4. ADD ENTRIES IN COLUMN (D) AND ENTER THE SUM ON LINE 35.

5. THE LOADED VESSEL'S LCG IS OBTAINED BY DIVIDING THE SUM OF COLUMN (D) ON LINE 35 BY THE DISPLACEMENT, LINE 35, COLUMN (B). ENTER THE RESULT UNDER COLUMN (C) ON LINE 35 AND ON LINE 38.

6. FOR EACH LOADED SPACE, THE APPROPRIATE VALUE FOR THE HEIGHT OF ITS VERTICAL CENTER OF GRAVITY (VCG) ABOVE THE BASELINE IS GIVEN IN COLUMN (E). MULTIPLY EACH ENTRY IN COLUMN (B) BY THE NUMBER IN COLUMN (E) AND ENTER THE PRODUCT IN COLUMN (F).

7. ADD ENTRIES IN COLUMN (F) AND ENTER THE SUM ON LINE 35.

8. THE LOADED VESSEL'S VCG IS OBTAINED BY DIVIDING THE SUM OF COLUMN (F) ON LINE 35 BY THE DISPLACEMENT, LINE 35, COLUMN (B). ENTER THE RESULT UNDER COLUMN (E) ON LINE 35 AND ON LINE 51.

9. FOR EACH TANK WHICH IS NOT EMPTY OR PRESSED UP, ENTER COLUMN (G) WITH THE APPROPRIATE FREE SURFACE FROM THE TABLE ON PAGE 18. "SLACK" FREE SURFACE HAS BEEN ENTERED FOR THE SETTLERS AND FOR CONSUMABLE LIQUID STOWAGE TANKS. THIS REQUIREMENT WILL ALLOW THE USE OF THE VESSEL'S TANKAGE WITHOUT UNDETECTED LOW STABILITY DUE TO FREE SURFACE OCCURRING AT ANY TIME DURING THE VOYAGE.

10. ADD ENTRIES IN COLUMN (G) AND ENTER THE SUM ON LINE 35.

11. THE FREE SURFACE CORRECTION TO GM IS OBTAINED BY DIVIDING THE SUM OF COLUMN (G) ON LINE 35 BY THE DISPLACEMENT, LINE 35, COLUMN (B). ENTER THE RESULT ON LINE 53.

PROCEDURE FOR CALCULATION (CONT'D)

12. REFER TO THE GRAPH OF HYDROSTATIC DATA ON PAGE 22 OR 23. PLACE A STRAIGHT EDGE (SUCH AS A TRIANGLE) ACROSS THE GRAPH AT THE DISPLACEMENT OBTAINED IN STEP 2 AND SUCH THAT THE SAME DRAFT IS READ IN BOTH DRAFT COLUMNS. READ DRAFT, TRANSVERSE METACENTER, LCF, LCB, MOMENT TO TRIM 1", AND TONS PER INCH IMMERSION, AND ENTER THESE VALUES ON LINES 44, 50, 43, 39, 41 AND 37, RESPECTIVELY.

13. COMPLETE THE DRAFT AND TRIM CALCULATIONS BY PERFORMING THE OPERATIONS INDICATED ON LINES 40, 42, 45, 46, 47, 48 AND 49. BE SURE TO RECORD THE PROPER SIGN (+ OR -) ON LINES 40, 42 AND 45.

14. COMPLETE THE STABILITY CALCULATIONS BY PERFORMING THE OPERATIONS INDICATED ON LINES 52, 54, 55 AND 56.

CONVERSION/DENSITY TABLES

A.P.I. CONVERSION DATA (60°F) - CARGO OIL

API GRAV.	SPEC. GRAV.	LBS. U.S.GAL.	GALS/TON U.S.	BBLS/TON U.S.	CU. FT./TON
18	0.9465	7.891	283.88	6.758	37.947
26	0.8984	7.490	299.08	7.119	39.979
34	0.8550	7.128	314.28	7.481	42.011
44	0.8063	6.722	333.28	7.934	44.551

LIQUID DENSITIES - MISC. DEADWEIGHT

FUEL OIL (15°API):	1 TON=37.23 CU. FT.=278.46 GALLONS=6.63 BBLS.
DIESEL OIL:	1 TON=41.00 CU. FT.=306.68 GALLONS=7.302 BBLS.
LUBE OIL:	1 TON=40.00 CU. FT.=299.20 GALLONS=7.124 BBLS.
SALT WATER:	1 TON=35.00 CU. FT.=261.82 GALLONS=6.234 BBLS.
FRESH WATER:	1 TON=36.00 CU. FT.=269.30 GALLONS=6.412 BBLS.

CONVERSION OF UNITS OF VOLUME

1 CUBIC FOOT = 0.028317 CUBIC METER = 7.48052 GALLONS
1 BARREL = 5.615 CUBIC FEET = 42 GALLONS

CONVERSION OF UNITS OF LENGTH

1 INCH = 2.54 CENTIMETERS
1 FOOT = 0.3048 METERS

NOTE:

1. ALL TONS HEREIN ARE LONG TONS OF 2240 LBS.

2. ALL GALLONS HEREIN ARE U.S. GALLONS EQUIVALENT TO 0.83268 IMPERIAL GALLONS.

CAPACITIES & CENTERS OF GRAVITY

CARGO OIL

FRAMES	TANK	CAPACITY - BBLS 100% FULL	CAPACITY - BBLS 98% FULL	CENTERS OF GRAVITY ABOVE BL	CENTERS OF GRAVITY AFT OF FP
105-109	CENTER No. 1	97422	95474	49.32	115.85
97-105	CENTER No. 2	194638	190745	49.30	223.34
93-97	CENTER No. 3	97163	95220	49.30	330.83
77-85	CENTER No. 5	193615	189743	49.30	581.67
73-77	CENTER No. 6	96967	95028	49.30	689.17
65-73	CENTER No. 7	193985	190105	49.30	796.67
59-65	CENTER No. 8	119583	117191	53.95	914.00
105-109	WING No. 1 PORT	56358	55231	53.81	119.55
105-109	WING No. 1 STARBOARD	56358	55231	53.81	119.55
101-105	WING No. 2 PORT	81314	79687	50.70	188.63
101-105	WING No. 2 STARBOARD	81314	79687	50.70	188.63
97-101	WING No. 3 PORT	89757	87962	49.00	259.37
97-101	WING No. 3 STARBOARD	89757	87962	49.00	259.37
93-97	WING No. 4 PORT	91193	89369	48.40	330.86
93-97	WING No. 4 STARBOARD	91193	89369	48.40	330.86
89-93	WING No. 5 PORT	91279	89453	48.35	402.50
89-93	WING No. 5 STARBOARD	91279	89453	48.35	402.50
85-89	WING No. 6 PORT	91279	89453	48.35	474.17
85-89	WING No. 6 STARBOARD	91279	89453	48.35	474.17
81-85	WING No. 7 PORT	91267	89442	48.35	545.83
81-85	WING No. 7 STARBOARD	91267	89442	48.35	545.83
77-81	WING No. 8 PORT	91279	89453	48.35	617.50
77-81	WING No. 8 STARBOARD	91279	89453	48.35	617.50
73-77	WING No. 9 PORT	91279	89453	48.35	689.17
73-77	WING No. 9 STARBOARD	91279	89453	48.35	689.17
69-73	WING No. 10 PORT	91153	89330	48.42	760.80
69-73	WING No. 10 STARBOARD	91153	89330	48.42	760.80
65-69	WING No. 11 PORT	88994	87214	49.32	832.18
65-69	WING No. 11 STARBOARD	88994	87214	49.32	832.18
61-65	WING No. 12 PORT	78864	77286	52.62	902.87
61-65	WING No. 12 STARBOARD	78840	77263	52.62	902.87
TOTAL		3,061,381	3,000,147		

SALT WATER BALLAST

FRAME	TANK	CAPACITY	CAPACITY 100% FULL S.W. TONS	CENTERS OF GRAVITY ABOVE BL	CENTERS OF GRAVITY AFT OF FP
109 FWD	FOREPEAK		17,158.99	50.23	49.79
23 AFT	AFTER PEAK		3,274.13	67.28	1,122.09
85-93	CENTER No. 4		31,156.40	49.30	438.33
23-50	S.W. BALLAST PORT		3,639.99	75.43	1,048.60
23-47	S.W. BALLAST STARBOARD		3,211.82	77.51	1,052.62
32-58	DOUBLE BOTTOM		892.06	6.41	1,026.43
TOTAL			59,333.4		

CAPACITIES & CENTERS OF GRAVITY

FRESH WATER

FRAMES	TANK	CAPACITY	CAPACITY 100% FULL F.W. TONS	CENTERS OF GRAVITY ABOVE BL	CENTERS OF GRAVITY AFT OF FP
50-57	DISTILLED WATER		460.64	86.29	1003.75
50-57	POTABLE WATER		162.11	86.29	1003.75
TOTAL			622.75		

MISCELLANEOUS

FRAMES	TANK	CAPACITY - CUBIC FEET 100% FULL	CAPACITY - CUBIC FEET 98% FULL	CENTERS OF GRAVITY ABOVE BL	CENTERS OF GRAVITY AFT OF FP
23-32	BILGE WATER STORAGE	4633	4540	7.05	1080.32
54-55	SLUDGE	182	179	8.97	1003.41
44-47	SEWAGE HOLDING	1837	1800	46.07	1027.60
TOTAL		6652	6519		

LUBE OIL

FRAMES	TANK	CAPACITY-GALLONS 100% FULL	CAPACITY-GALLONS 98% FULL	CENTERS OF GRAVITY ABOVE BL	CENTERS OF GRAVITY AFT OF FP
41-44	LUBE OIL STORAGE	11,020	10,800	85.41	1036.50
38-41	LUBE OIL SETTLING	10,938	10,719	85.41	1045.50
TOTAL		21,958	21,519		

FUEL OIL

FRAMES	TANK	CAPACITY-BARRELS 100% FULL	CAPACITY-BARRELS 98% FULL	CENTERS OF GRAVITY ABOVE BL	CENTERS OF GRAVITY AFT OF FP
47-50	LOW SULFUR FUEL OIL	4340	4253	70.52	1018.44
47-50	DIESEL OIL	1672	1639	87.70	1018.47
50-61	FUEL OIL STORAGE PORT	54490	53400	61.20	972.81
50-61	FUEL OIL STORAGE STARBOARD	54490	53400	61.20	972.81
58-59	FUEL OIL SETTLING PORT	3340	3273	73.66	981.64
58-59	FUEL OIL SETTLING STARBOARD	3340	3273	73.66	981.64
TOTAL		121672	119238		

TABLE FOR FREE SURFACE CORRECTIONS

CARGO OIL TANKS

TANK	FRAMES	CARGO @ 38.0 FT³/LT 98% FULL	CARGO @ 38.0 FT³/LT SLACK	CARGO @ 44.38 FT³/LT 98% FULL	CARGO @ 44.38 FT³/LT SLACK	S.W. BALLAST 98% FULL	S.W. BALLAST SLACK
CTR. NO. 1	105-109	57187	75562	49076	64846	62089	82039
CTR. NO. 2	97-105	114375	151125	98154	64846	124178	164078
CTR. NO. 3	93-97	57187	75562	49076	64846	62089	82039
CTR. NO. 5	77-85	114375	151125	98154	64846	124178	164078
CTR. NO. 6	73-77	57187	75562	49076	64846	62089	82039
CTR. NO. 7	65-73	114375	151125	98154	95002	124178	164078
CTR. NO. 8	59-65	83782	110702	71900	55243	90963	120191
WG. NO. 1 P/S	105-109	49809	64372	42744	105050	54078	69890
WG. NO. 2 P/S	101-105	94717	122411	81284	114772	102835	132903
WG. NO. 3 P/S	97-101	103483	133741	88806	114772	112353	145204
WG. NO. 4 P/S	93-97	103483	133741	88806	114772	112353	145204
WG. NO. 5 P/S	89-93	103483	133741	88806	114772	112353	145204
WG. NO. 6 P/S	85-89	103483	133741	88806	114772	112353	145204
WG. NO. 7 P/S	81-85	103483	133741	88806	114772	112353	145204
WG. NO. 8 P/S	77-81	103483	133741	88806	114772	112353	145204
WG. NO. 9 P/S	73-77	103483	133741	88806	114772	112353	145204
WG. NO. 10 P/S	69-73	103483	133741	88806	114772	112353	145204
WG. NO. 11 P/S	65-69	103483	133741	88806	114772	112353	145204
WG. NO. 12 P/S	61-65	100963	130484	86640	111978	109617	141668

NOTE: USE THE VALUE IN THE 98% FULL COLUMN UNLESS THE LIQUID SURFACE IS BELOW THE 98% LEVEL, IN WHICH CASE USE THE VALUE IN THE SLACK COLUMN.

SALT WATER BALLAST

TANK	FRAMES	SLACK
FOREPEAK	109-FWD	234179
CTR. NO. 4	85-93	164078
S.W.B. WG. P/S	23-47&50	40862
DOUBLE BOTTOM	32-58	30421
AFTER PEAK	23-AFT	172199

CONSUMABLE LIQUIDS

TANKS	FRAMES	SLACK
F.O. STOR. P/S	50-61	103124
F.O. SETT. P/S	58-59	1046
L.S.F.O. S	47-50	4314
DIESEL OIL P	47-50	3917
LUBE OIL	-	24
DIST. WATER P	50-58	6367
POT. WATER S	50-58	280

NOTE:
SEE THE FOLLOWING PAGE FOR INSTRUCTIONS.

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FRAME

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GENERAL NOTES (CONT'D)

6. DRAFTS HEREIN REFERRED TO AS MEAN, FWD, AND AFT ARE DRAFTS AT MIDSHIP, FOREWARD PERPENDICULAR, AND AFTER PERPENDICULAR, RESPECTIVELY. GENERALLY, IT IS SUFFICIENTLY ACCURATE TO ASSUME THAT THESE LOCATIONS COINCIDE WITH THE DRAFT MARKS. HOWEVER, IF GREATER ACCURACY IS DESIRED, DRAFTS AT THE DRAFT MARKS MAY BE COMPUTED USING THE CORRECTIONS GIVEN ON PAGE 8.

7. ALL TONS HEREIN ARE LONG TONS OF 2240 LBS.

OPERATING INSTRUCTIONS

1. NO CARGO TANK SHALL BE LOADED TO MORE THAN 98% OF THE TANK VOLUME (SEE PAGE 16).
2. AT DRAFTS GREATER THAN 65 FEET, THE VESSEL SHALL NOT BE OPERATED WITH A TRIM BETWEEN PERPENDICULARS EXCEEDING 10 FEET, EITHER BY THE BOW OR BY THE STERN. AT DRAFTS OF 65 FEET OR LESS, TRIMS NOT EXCEEDING 10 FEET BY THE BOW OR 20 FEET BY THE STERN MAY BE PERMITTED.
3. ALL UPPER DECK HATCHES, MANHOLES, SCUTTLES, AND WEATHER DOORS SHALL BE KEPT CLOSED AND FULLY SECURED AT ALL TIMES WHEN UNDERWAY, EXCEPT WHEN ACTUALLY USED FOR TRANSIT UNDER SAFE CONDITIONS.
4. ALL BOLTED WATERTIGHT MANHOLE COVERS THROUGHOUT THE SHIP SHALL BE KEPT CLOSED AND FULLY SECURED EXCEPT WHEN ACTUALLY IN USE UNDER SAFE CONDITIONS.
5. ALL VALVES IN THE CARGO AND BALLAST SYSTEMS SHALL BE KEPT CLOSED AT ALL TIMES EXCEPT WHEN ACTUALLY IN USE DURING LOADING OR BALLASTING OPERATIONS.
6. CROSS CONNECTIONS BETWEEN PORT AND STARBOARD FUEL OIL STORAGE AND SETTLING TANKS SHALL BE KEPT CLOSED AT ALL TIMES EXCEPT WHEN ACTUALLY IN USE FOR TRANSFER OF FUEL OIL.
7. BILGES NOT BEING UTILIZED AS TANKAGE SHALL BE KEPT PUMPED TO MINIMUM CONTENT AT ALL TIMES.
8. SYMMETRICAL TANK PAIRS SHALL BE KEPT FILLED TO APPROXIMATELY THE SAME LEVEL PORT AND STARBOARD TO ELIMINATE LIST.
9. THE NUMBER OF SLACK CARGO AND BALLAST TANKS SHALL BE KEPT TO A MINIMUM CONSISTENT WITH OPERATIONAL REQUIREMENTS.
10. DURING BALLASTING OR DEBALLASTING, AND DURING LOADING OR UNLOADING OF CARGO, A REDUCTION IN THE VESSEL'S GM WILL OCCUR DUE TO SLACK TANK FREE SURFACE UNTIL THE TANK IS PRESSED UP OR EMPTY. THIS TEMPORARY LOSS OF GM (IN FEET) IS EQUAL TO THE SLACK FREE SURFACE MOMENT OF THE TANK DIVIDED BY THE VESSEL'S DISPLACEMENT (IN LONG TONS). SEE PAGE 18 FOR FREE SURFACE MOMENTS.
11. CARE SHOULD BE TAKEN TO ASSURE THAT THE VESSEL WILL HAVE AT LEAST TWO INCHES OF POSITIVE GM DURING LOADING OR UNLOADING OPERATIONS WHILE IN PORT. SEE INSTRUCTION NO. 10.
12. IN SEA-GOING CONDITIONS, THE VESSEL'S GM SHALL BE EQUAL TO OR GREATER THAN THE GM REQUIRED AS READ FROM THE CURVE OF GM REQUIRED ON PAGE 20.

OPERATING INSTRUCTIONS (CONT'D)

13. IN THE EVENT OF DAMAGE TO THE VESSEL WHICH MAY RESULT IN FLOODING, THE FOLLOWING ACTIONS SHOULD BE TAKEN IMMEDIATELY:
    A) VERIFY THAT ALL OPENINGS SPECIFIED IN INSTRUCTION NO. 3 ARE CLOSED AND FULLY SECURED, AND IN ADDITION, CLOSE AND SECURE ALL VENTS AND ANY OTHER OPENINGS ON UPPER DECK WHICH ARE PROVIDED WITH COVERS, DOORS, OR OTHER MEANS OF BEING MADE WATERTIGHT OR WEATHERTIGHT.
    B) VERIFY THAT ALL VALVES SPECIFIED IN INSTRUCTIONS 5 AND 6 ARE FULLY CLOSED.

PROCEDURE FOR CALCULATION

LOADING TABLE AND TRIM & STABILITY CALCULATIONS, PAGE 28:

1. FOR EACH LOADED SPACE ON THE VESSEL, ENTER WEIGHT (IN LONG TONS) IN COLUMN (B). SEE PAGES 16 AND 17.
2. THE LOADED VESSEL'S DISPLACEMENT IS OBTAINED BY ADDING THE ENTRIES IN COLUMN (B) ON LINES 1 THRU 34. ENTER THE SUM ON LINES 35 AND 36.
3. FOR EACH LOADED SPACE, THE APPROPRIATE VALUE FOR THE DISTANCE OF ITS LONGITUDINAL CENTER OF GRAVITY (LCG) FROM THE FOREWARD PERPENDICULAR IS GIVEN IN COLUMN (C). MULTIPLY EACH ENTRY IN COLUMN (B) BY THE NUMBER IN COLUMN (C) AND ENTER THE PRODUCT IN COLUMN (D).
4. ADD ENTRIES IN COLUMN (D) AND ENTER THE SUM ON LINE 35.
5. THE LOADED VESSEL'S LCG IS OBTAINED BY DIVIDING THE SUM OF COLUMN (D) ON LINE 35 BY THE DISPLACEMENT, LINE 35, COLUMN (B). ENTER THE RESULT UNDER COLUMN (C) ON LINE 35 AND ON LINE 38.
6. FOR EACH LOADED SPACE, THE APPROPRIATE VALUE FOR THE HEIGHT OF ITS VERTICAL CENTER OF GRAVITY (VCG) ABOVE THE BASELINE IS GIVEN IN COLUMN (E). MULTIPLY EACH ENTRY IN COLUMN (B) BY THE NUMBER IN COLUMN (E) AND ENTER THE PRODUCT IN COLUMN (F).
7. ADD ENTRIES IN COLUMN (F) AND ENTER THE SUM ON LINE 35.
8. THE LOADED VESSEL'S VCG IS OBTAINED BY DIVIDING THE SUM OF COLUMN (F) ON LINE 35 BY THE DISPLACEMENT, LINE 35, COLUMN (B). ENTER THE RESULT UNDER COLUMN (E) ON LINE 35 AND ON LINE 51.
9. FOR EACH TANK WHICH IS NOT EMPTY OR PRESSED UP, ENTER COLUMN (G) WITH THE APPROPRIATE FREE SURFACE FROM THE TABLE ON PAGE 18. "SLACK" FREE SURFACE HAS BEEN ENTERED FOR THE SETTLERS AND FOR CONSUMABLE LIQUID STOWAGE TANKS. THIS REQUIREMENT WILL ALLOW THE USE OF THE VESSEL'S TANKAGE WITHOUT UNDETECTED LOW STABILITY DUE TO FREE SURFACE OCCURRING AT ANY TIME DURING THE VOYAGE.
10. ADD ENTRIES IN COLUMN (G) AND ENTER THE SUM ON LINE 35.
11. THE FREE SURFACE CORRECTION TO GM IS OBTAINED BY DIVIDING THE SUM OF COLUMN (G) ON LINE 35 BY THE DISPLACEMENT, LINE 35, COLUMN (B). ENTER THE RESULT ON LINE 53.

PROCEDURE FOR CALCULATION (CONT'D)

12. REFER TO THE GRAPH OF HYDROSTATIC DATA ON PAGE 22 OR 23. PLACE A STRAIGHT EDGE (SUCH AS A TRIANGLE) ACROSS THE GRAPH AT THE DISPLACEMENT OBTAINED IN STEP 2 AND SUCH THAT THE SAME DRAFT IS READ IN BOTH DRAFT COLUMNS. READ DRAFT, TRANSVERSE METACENTER, LCF, LCB, MOMENT TO TRIM 1", AND TONS PER INCH IMMERSION, AND ENTER THESE VALUES ON LINES 44, 50, 43, 39, 41 AND 37, RESPECTIVELY.
13. COMPLETE THE DRAFT AND TRIM CALCULATIONS BY PERFORMING THE OPERATIONS INDICATED ON LINES 40, 42, 45, 46, 47, 48 AND 49. BE SURE TO RECORD THE PROPER SIGN (+ OR -) ON LINES 40, 42 AND 45.
14. COMPLETE THE STABILITY CALCULATIONS BY PERFORMING THE OPERATIONS INDICATED ON LINES 52, 54, 55 AND 56.

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1 FOOT = 0.3048 METERS

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2. ALL GALLONS HEREIN ARE U.S. GALLONS EQUIVALENT TO 0.83268 IMPERIAL GALLONS.

CAPACITIES & CENTERS OF GRAVITY

CARGO OIL

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23-47	S.W. BALLAST STARBOARD		3,211.82	77.51	1,052.62
32-58	DOUBLE BOTTOM		892.06	6.41	1,026.43
TOTAL			59,333.4		

CAPACITIES & CENTERS OF GRAVITY

FRESH WATER

FRAMES	TANK	CAPACITY	CAPACITY 100% FULL F.W. TONS	CENTERS OF GRAVITY ABOVE BL	CENTERS OF GRAVITY AFT OF FP
50-57	DISTILLED WATER		460.64	86.29	1,003.75
50-57	POTABLE WATER		162.11	86.29	1,003.75
TOTAL			622.75		

MISCELLANEOUS

FRAMES	TANK	CAPACITY - CUBIC FEET 100% FULL	CAPACITY - CUBIC FEET 98% FULL	CENTERS OF GRAVITY ABOVE BL	CENTERS OF GRAVITY AFT OF FP
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54-55	SLUDGE	182	179	8.97	1003.41
44-47	SEWAGE HOLDING	1837	1800	46.07	1027.60
TOTAL		6652	6519		

LUBE OIL

FRAMES	TANK	CAPACITY - GALLONS 100% FULL	CAPACITY - GALLONS 98% FULL	CENTERS OF GRAVITY ABOVE BL	CENTERS OF GRAVITY AFT OF FP
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38-41	LUBE OIL SETTLING	10,938	10,719	85.41	1045.50
TOTAL		21,958	21,519		

FUEL OIL

FRAMES	TANK	CAPACITY - BARRELS 100% FULL	CAPACITY - BARRELS 98% FULL	CENTERS OF GRAVITY ABOVE BL	CENTERS OF GRAVITY AFT OF FP
47-50	LOW SULFUR FUEL OIL	4340	4253	70.52	1018.44
47-50	DIESEL OIL	1672	1639	87.70	1018.47
50-61	FUEL OIL STORAGE PORT	54490	53400	61.20	972.81
50-61	FUEL OIL STORAGE STARBOARD	54490	53400	61.20	972.81
58-59	FUEL OIL SETTLING PORT	3340	3273	73.66	981.64
58-59	FUEL OIL SETTLING STARBOARD	3340	3273	73.66	981.64
TOTAL		121672	119238		

TABLE FOR FREE SURFACE CORRECTIONS

CARGO OIL TANKS

TANK	FRAMES	CARGO @ 38.0 FT³/LT 98% FULL	CARGO @ 38.0 FT³/LT SLACK	CARGO @ 44.38 FT³/LT 98% FULL	CARGO @ 44.38 FT³/LT SLACK	S.W. BALLAST 98% FULL	S.W. BALLAST SLACK
CTR. NO. 1	105-109	57187	75562	49076	64846	62089	82039
CTR. NO. 2	97-105	114375	151125	98154	64846	124178	164078
CTR. NO. 3	93-97	57187	75562	49076	64846	62089	82039
CTR. NO. 5	77-85	114375	151125	98154	64846	124178	164078
CTR. NO. 6	73-77	57187	75562	49076	64846	62089	82039
CTR. NO. 7	65-73	114375	151125	98154	95002	124178	164078
CTR. NO. 8	59-65	83782	110702	71900	55243	90963	120191
WG. NO. 1 P/S	105-109	49809	64372	42744	105050	54078	69890
WG. NO. 2 P/S	101-105	94717	122411	81284	114772	102835	132903
WG. NO. 3 P/S	97-101	103483	133741	88806	114772	112353	145204
WG. NO. 4 P/S	93-97	103483	133741	88806	114772	112353	145204
WG. NO. 5 P/S	89-93	103483	133741	88806	114772	112353	145204
WG. NO. 6 P/S	85-89	103483	133741	88806	114772	112353	145204
WG. NO. 7 P/S	81-85	103483	133741	88806	114772	112353	145204
WG. NO. 8 P/S	77-81	103483	133741	88806	114772	112353	145204
WG. NO. 9 P/S	73-77	103483	133741	88806	114772	112353	145204
WG. NO. 10 P/S	69-73	103483	133741	88806	114772	112353	145204
WG. NO. 11 P/S	65-69	103483	133741	88806	114772	112353	145204
WG. NO. 12 P/S	61-65	100963	130484	86640	111978	109617	141668

NOTE: USE THE VALUE IN THE 98% FULL COLUMN UNLESS THE LIQUID SURFACE IS BELOW THE 98% LEVEL, IN WHICH CASE USE THE VALUE IN THE SLACK COLUMN.

SALT WATER BALLAST

TANK	FRAMES	SLACK
FOREPEAK	109-FWD	234179
CTR. NO. 4	85-93	164078
S.W.B. WG. P/S	23-47 & 50	40862
DOUBLE BOTTOM	32-58	30421
AFTER PEAK	23-AFT	172199

CONSUMABLE LIQUIDS

TANKS	FRAMES	SLACK
F.O. STOR. P/S	50-61	103124
F.O. SETT. P/S	58-59	1046
L.S.F.O. S	47-50	4314
DIESEL OIL P	47-50	3917
LUBE OIL	—	24
DIST. WATER P	50-58	6367
POT. WATER S	50-58	280

NOTE:
SEE THE FOLLOWING PAGE FOR INSTRUCTIONS.

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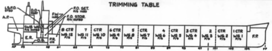
TRIMMING TABLE



1000 T (SEE EXAMPLE)

CHANGE IN DRAFT (IN INCHES) FOR EACH 1000 TONS LOADED IN ANY TANK:

TANK:	74' DRAFT AFT	74' DRAFT FWD	35' DRAFT AFT	35' DRAFT FWD
A.P.	+2.79	-4.33	+10.93	-6.07
SWB WG	+7.00	-3.52	+9.83	-5.08
D.B.	+6.74	-3.25	+9.45	-4.75
L.S.F.O., D.O.	+6.65	-3.16	+9.33	-4.64
F.W.	+6.49	-3.00	+9.11	-4.45
F.O. SET.	+6.25	-2.75	+8.76	-4.15
F.O. STOR.	+6.15	-2.65	+8.63	-4.01
8 CTR	+5.50	-1.99	+7.72	-3.14
WG 12	+5.38	-1.86	+7.55	-3.04
WG 11	+4.60	-1.07	+6.46	-2.06
7 CTR	+4.21	-0.67	+5.91	-1.57
WG 10	+3.81	-0.27	+5.36	-1.08
6 CTR, WG 9	+3.05	+0.56	+4.26	-0.09
WG 8	+2.24	+1.34	+3.15	+0.90
5 CTR	+1.84	+1.74	+2.60	+1.40
WG 7	+1.45	+2.15	+2.05	+1.89
WG 6	+0.66	+2.95	+0.95	+2.88
4 CTR	+0.26	+3.35	+0.39	+3.38
WG 5	-0.13	+3.76	-0.16	+3.87
3 CTR, WG 4	-0.92	+4.56	-1.26	+4.86
WG 3	-1.71	+5.36	-2.36	+5.85
2 CTR	-2.10	+5.77	-2.92	+6.35
WG 2	-2.48	+6.16	-3.45	+6.83
WG 1	-3.25	+6.95	-4.52	+7.78
1 CTR	-3.29	+6.97	-4.57	+7.83
F.P.	-4.01	+7.72	-5.59	+8.75

EXAMPLE: FIND CHANGE IN DRAFT AFTER LOADING 1000 TONS IN WING TANK NO. 3

	FORWARD	AFT
ORIGINAL DRAFTS	73'-6⅝"	74'-1¾"
CORRECTION - FROM TABLE MARKED 74' DRAFT	+0'-5⅜"	-0'-1¾"
NEW DRAFTS	74'-0"	74'-0"

NOTES: 1. THE CORRECTIONS WERE COMPUTED FOR TWO DRAFTS TO FACILITATE INTERPOLATION, BUT IN PRACTICE IT WILL BE SUFFICIENTLY ACCURATE TO REFER TO THE TABLE NEAREST THE SHIP'S DRAFT.

2. WHEN DISCHARGING, USE THE TABLE AS FOR LOADING AND CHANGE THE + AND - SIGNS.

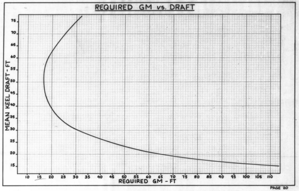
SUMMARY OF LOADING CONDITIONS

ITEM		COND.# 1 LIGHT SHIP (TONS)	COND.# 2 DOCKING (TONS)	COND.# 3 FULL LOAD DEPARTURE 98% F.O. (TONS)	COND.# 4 FULL LOAD ARRIVAL 50% F.O. (TONS)	COND.# 5 FULL LOAD DEPARTURE 50% F.O. (TONS)
CARGO NO. 1 CTR		0	0	12079	12079	12337
CARGO NO. 2 CTR		0	0	24135	24135	24647
CARGO NO. 3 CTR		0	0	12047	12047	12304
CARGO NO. 5 CTR		0	0	24066	24066	24517
CARGO NO. 6 CTR		0	0	12023	12023	12279
CARGO NO. 7 CTR		0	0	24052	24052	24564
CARGO NO. 8 CTR		0	0	14827	14827	15143
CARGO NO. 1 WGS	P/S	0	0	13976	13976	14273
CARGO NO. 2 WGS	P/S	0	0	20164	20164	20593
CARGO NO. 3 WGS	P/S	0	0	22258	22258	22732
CARGO NO. 4 WGS	P/S	0	0	22614	22614	23095
CARGO NO. 5 WGS	P/S	0	0	22635	22635	23117
CARGO NO. 6 WGS	P/S	0	0	22635	22635	23117
CARGO NO. 7 WGS	P/S	0	0	22635	22635	23114
CARGO NO. 8 WGS	P/S	0	0	22635	22635	23117
CARGO NO. 9 WGS	P/S	0	0	22635	22635	23117
CARGO NO. 10 WGS	P/S	0	0	22604	22604	23085
CARGO NO. 11 WGS	P/S	0	0	22069	22069	22538
CARGO NO. 12 WGS	P/S	0	0	19554	19554	19970
CARGO TANKS		0	0	379579	379579	387659
F.O. STORAGE	P/S	0	0	16107	7734	7734
F.O. SETTLERS	P/S	0	500	987	987	987
LOW SULFUR F.O.	S	0	100	641	641	641
LUBE OIL		0	64	64	64	64
DIESEL OIL	P	0	100	225	225	225
POTABLE WATER		0	100	162	162	162
DISTILLED WATER		0	100	461	461	461
FOREPEAK		0	5000	0	0	0
NO. 4 CTR		0	17500	0	0	0
S.W. BALLAST WGS	P/S	0	0	0	0	0
DOUBLEBOTTOM		0	0	0	0	0
AFTER PEAK		0	0	0	0	0
CREW & STORES		0	50	50	50	50
DEADWEIGHT		0	23514	398276	389903	397983
LIGHT SHIP		58840	58840	58840	58840	58840
DISPLACEMENT		58840	82354	457116	448743	456823
KEEL DRAFT FORWARD	FT	5.23	14.37	72.40	74.42	75.36
AMIDSHIPS	FT	11.47	15.27	75.03	73.92	75.03
AFT	FT	17.70	16.16	77.65	73.41	74.20
LONGL. C.G. AFT F.P.	FT	604.53	540.39	554.11	546.29	545.93
LONGL. C.B. AFT F.P.	FT	532.30	532.60	547.90	547.40	547.90
TRIMMING LEVER	FT	72.23	7.79	6.21	-1.11	-1.97
MOMENT TO TRIM 1"	FT-TONS	28440	29900	45050	44800	45050
TRIM, + AFT - FWD	FT	12.47	1.79	5.25	-1.01	-1.66
TRANS. KM	FT	354.70	266.00	95.30	95.50	95.30
VERT. C.G. ABV. B.L.	FT	66.50	62.04	52.26	52.09	52.04
GM UNCORRECTED	FT	288.20	203.96	43.04	43.41	43.26
FREE SURF. CORR.	FT	0.00	5.03	3.59	3.66	3.66
GM AVAILABLE	FT	288.20	198.93	39.45	39.75	39.60
GM REQUIRED	FT	—	110.00	29.90	28.60	29.90

SUMMARY OF LOADING CONDITIONS

ITEM		COND.# 6 FULL LOAD ARRIVAL 10% F.O. (TONS)	COND.# 7 50% CARGO 98% F.O. (TONS)	COND.# 8 LIGHT BALLAST 76% F.O. (TONS)	COND.# 9 LIGHT BALLAST 50% F.O. (TONS)	COND.# 10 LIGHT CLEANED BALLAST 50% F.O. (TONS)
CARGO NO. 1 CTR		12337	0	0	0	0
CARGO NO. 2 CTR		24647	0	0	0	0
CARGO NO. 3 CTR		12304	0	0	0	14000
CARGO NO. 5 CTR		24517	0	0	0	23150
CARGO NO. 6 CTR		12279	0	0	0	15245
CARGO NO. 7 CTR		24564	0	3750	10000	0
CARGO NO. 8 CTR		15143	0	0	0	0
CARGO NO. 1 WGS	P/S	14273	14096	0	0	0
CARGO NO. 2 WGS	P/S	20593	20338	0	0	0
CARGO NO. 3 WGS	P/S	22732	22450	0	0	0
CARGO NO. 4 WGS	P/S	23095	0	0	0	0
CARGO NO. 5 WGS	P/S	23117	22831	0	0	0
CARGO NO. 6 WGS	P/S	23117	22831	0	0	0
CARGO NO. 7 WGS	P/S	23114	22828	20000	20000	0
CARGO NO. 8 WGS	P/S	23117	0	0	0	0
CARGO NO. 9 WGS	P/S	23117	22831	28702	28702	0
CARGO NO. 10 WGS	P/S	23085	22800	0	0	0
CARGO NO. 11 WGS	P/S	22538	22259	0	0	0
CARGO NO. 12 WGS	P/S	19970	0	0	0	4000
CARGO TANKS		387659	193264	52452	58702	56995
F.O. STORAGE	P/S	757	16107	12000	7734	7734
F.O. SETTLERS	P/S	987	987	987	987	987
LOW SULFUR F.O.	S	641	641	641	641	641
LUBE OIL		64	64	64	64	64
DIESEL OIL	P	225	225	225	225	225
POTABLE WATER		162	162	162	162	162
DISTILLED WATER		461	461	461	461	461
FOREPEAK		0	0	13000	13000	4000
NO. 4 CTR		0	0	30533	25000	30533
S.W. BALLAST WGS	P/S	6852	0	0	0	3000
DOUBLEBOTTOM		0	0	0	0	0
AFTER PEAK		0	0	0	0	0
CREW & STORES		50	50	50	50	50
DEADWEIGHT		397858	211961	110575	107026	104852
LIGHT SHIP		58840	58840	58840	58840	58840
DISPLACEMENT		456698	270801	169415	165866	163692
KEEL DRAFT FORWARD	FT	75.38	42.29	21.66	20.69	20.02
AMIDSHIPS	FT	74.99	46.60	30.52	29.96	29.57
AFT	FT	74.59	50.91	39.37	39.23	39.12
LONGL. C.G. AFT F.P.	FT	546.97	551.17	578.83	578.52	580.28
LONGL. C.B. AFT F.P.	FT	547.90	537.23	534.05	533.98	533.90
TRIMMING LEVER	FT	-0.93	13.94	44.78	44.54	46.38
MOMENT TO TRIM 1"	FT-TONS	45050	36480	33300	33200	33130
TRIM, + AFT - FWD	FT	-0.79	+8.62	+17.71	+18.54	+19.10
TRANS. KM	FT	95.30	112.50	150.00	152.30	154.0
VERT. C.G. ABV. B.L.	FT	52.27	53.95	56.36	56.21	57.11
GM UNCORRECTED	FT	43.03	58.55	93.64	96.09	96.89
FREE SURF. CORR.	FT	3.66	3.21	5.54	5.66	6.16
GM AVAILABLE	FT	39.37	55.34	88.10	90.43	90.73
GM REQUIRED	FT	29.75	18.0	31.0	31.0	32.0

REQUIRED GM vs. DRAFT



GRAPH OF HYDROSTATIC DATA

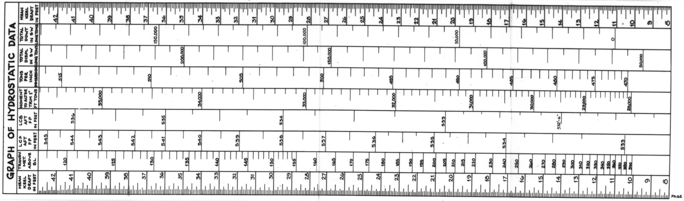


TABLE FOR FREE SURFACE CORRECTIONS

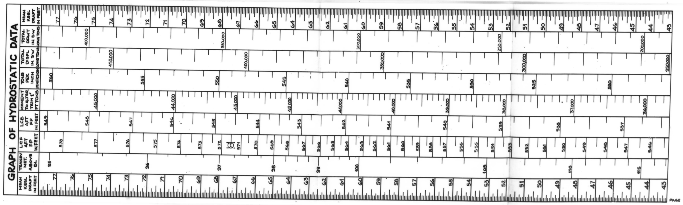
INSTRUCTIONS:

USE THE NUMBER CORRESPONDING TO EACH TANK IN THE TABLE UNLESS THE TANK IS EMPTY OR PRESSED-UP, IN WHICH CASE USE ZERO. DIVIDE THE TOTAL OF THESE NUMBERS BY THE DISPLACEMENT OF THE SHIP IN LONG TONS TO OBTAIN THE FREE SURFACE CORRECTION IN FEET.

LINEAR INTERPOLATION IN THE TABLE OF CARGO TANK FREE SURFACE CORRECTIONS FOR CARGO DENSITY IS PERMISSIBLE.

THE FREE SURFACE CORRECTIONS FOR TANKS DESIGNATED P/S ARE FOR THE TANK PAIR.

GRAPH OF HYDROSTATIC DATA



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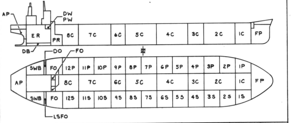
FRAME

SUMMARY OF LOADING CONDITIONS

ITEM		COND.# 11 HEAVY CLEANED BALLAST 50% F.O. (TONS)	COND.# (TONS)	COND.# (TONS)	COND.# (TONS)	COND.# (TONS)
CARGO NO. 1 CTR		0				
CARGO NO. 2 CTR		30601				
CARGO NO. 3 CTR		15276				
CARGO NO. 5 CTR		30440				
CARGO NO. 6 CTR		15245				
CARGO NO. 7 CTR		30498				
CARGO NO. 8 CTR		0				
CARGO NO. 1 WGS	P/S	0				
CARGO NO. 2 WGS	P/S	0				
CARGO NO. 3 WGS	P/S	0				
CARGO NO. 4 WGS	P/S	0				
CARGO NO. 5 WGS	P/S	0				
CARGO NO. 6 WGS	P/S	0				
CARGO NO. 7 WGS	P/S	0				
CARGO NO. 8 WGS	P/S	0				
CARGO NO. 9 WGS	P/S	0				
CARGO NO. 10 WGS	P/S	0				
CARGO NO. 11 WGS	P/S	0				
CARGO NO. 12 WGS	P/S	4000				
CARGO TANKS		126060				
F.O. STORAGE	P/S	7734				
F.O. SETTLERS	P/S	987				
LOW SULFUR F.O.	S	641				
LUBE OIL		64				
DIESEL OIL	P	225				
POTABLE WATER		162				
DISTILLED WATER		461				
FOREPEAK		16815				
NO. 4 CTR		30533				
S.W. BALLAST WGS	P/S	6852				
DOUBLEBOTTOM		0				
AFTER PEAK		0				
CREW & STORES		50				
DEADWEIGHT		190584				
LIGHT SHIP		58840				
DISPLACEMENT		249424				
KEEL DRAFT FORWARD	FT	41.63				
AMIDSHIPS	FT	43.07				
AFT	FT	44.51				
LONGL. C.G. AFT F.P.	FT	541.44				
LONGL. C.B. AFT F.P.	FT	536.49				
TRIMMING LEVER	FT	4.95				
MOMENT TO TRIM 1"	FT-TONS	35720				
TRIM, + AFT - FWD	FT	2.88				
TRANS. KM	FT	117.60				
VERT. C.G. ABV. B.L.	FT	54.87				
GM UNCORRECTED	FT	62.73				
FREE SURF. CORR.	FT	4.63				
GM AVAILABLE	FT	58.10				
GM REQUIRED	FT	18.00				



LOADING KEY:		CARGO OIL	LT	LCG AFT FP	FT	STABILITY:		CONDITION:
CARGO OIL	▤	FUEL OIL	LT	TRIM	FT	KM	FT	
FUEL OIL	▥	S.W. BALLAST	LT	MT 1"	FT-TONS	KG	FT	
S.W. BALLAST	▨	FRESH WATER	LT	TPI		GM	FT	
DIESEL OIL	■	MISC. DWT.	LT	DRAFT, FWD	FT	FREE SURF. CORR.	FT	
FRESH WATER	■	DEADWEIGHT	LT	MEAN	FT	GM AVAILABLE	FT	
		DISPLACEMENT	LT	AFT	FT	GM REQUIRED	FT	

CONTENT	LINE NO.	TANK		(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P. 18)
CARGO OR S.W. BALLAST	①	CTR NO. 1				115.85		49.32		
	②	CTR NO. 2				223.34		49.30		
	③	CTR NO. 3				330.83		49.30		
	④	CTR NO. 5				581.67		49.30		
	⑤	CTR NO. 6				689.17		49.30		
	⑥	CTR NO. 7				796.67		49.30		
	⑦	CTR NO. 8				914.00		53.95		
	⑧	WG NO. 1	P/S			119.55		53.81		
	⑨	WG NO. 2	P/S			188.63		50.70		
	⑩	WG NO. 3	P/S			259.37		49.00		
	⑪	WG NO. 4	P/S			330.86		48.40		
	⑫	WG NO. 5	P/S			402.50		48.35		
	⑬	WG NO. 6	P/S			474.17		48.35		
	⑭	WG NO. 7	P/S			545.83		48.35		
	⑮	WG NO. 8	P/S			617.50		48.35		
	⑯	WG NO. 9	P/S			689.17		48.35		
	⑰	WG NO. 10	P/S			760.80		48.42		
	⑱	WG NO. 11	P/S			832.18		49.32		
	⑲	WG NO. 12	P/S			902.87		52.62		
F.O.	⑳	STORAGE	P/S			972.81		61.20		103124
	㉑	SETTLERS	P/S			981.64		73.66		1046
	㉒	LOW SULFUR	S			1018.44		70.52		4514
	㉓	DIESEL OIL	P			1018.47		87.70		3917
	㉔	LUBE OIL				1048.32		92.12		24
F.W.	㉕	DISTILLED	P			1003.75		86.29		6367
	㉖	POTABLE	S			1003.75		86.29		280
S.W.B.	㉗	FOREPEAK				49.79		50.23		
	㉘	CTR NO. 4				438.33		49.30		
	㉙	S.W. BALLAST WG	P			1048.60		75.43		
	㉚	S.W. BALLAST WG	S			1052.62		77.51		
	㉛	DOUBLE BOTTOM				1026.43		6.41		
	㉜	AFTER PEAK				1122.09		67.28		
	㉝	CREW & STORES				1011.00		128.46		
	㉞	LIGHT SHIP			58840	604.53	35570545	66.50	3912860	
	㉟	TOTALS [SUM ①-㉞]								

CONDITION:

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]		TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]		
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]		FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]		FT
㊵	TRIM LEVER	[㊳-㊴, -FWD/+AFT]		FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]		FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), -FWD/+AFT]		FT
㊸	L.C.F. AFT F.P.	[FROM P. 22]		FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P. 22]		FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]		FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]		FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]		FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]		FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☐ YES ☐ NO SEE NOTE 1		

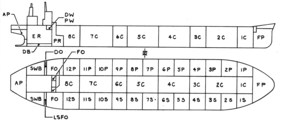
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]		FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]		FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]		FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]		FT
(54)	AVAILABLE GM	[(52)-(53)]		FT
(55)	REQUIRED GM	[FROM P. 20]		FT
(56)	IS (54) ≥ (55)? ☐ YES ☐ NO (SEE NOTE 2)			

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:		CARGO OIL	0 LT	LCG AFT FP	604.53 FT	STABILITY:		CONDITION: NO. 1 LIGHT SHIP
CARGO OIL	▤	FUEL OIL	0 LT	TRIM	12.47 FT	KM	354.70 FT	
FUEL OIL	▥	S.W. BALLAST	0 LT	MT 1"	28400 FT-TONS	KG	66.50 FT	
S.W. BALLAST	▨	FRESH WATER	0 LT	TPI	472.0	GM	288.20 FT	
DIESEL OIL	■	MISC. DWT.	0 LT	DRAFT, FWD	5.23 FT	FREE SURF. CORR.	0. FT	
FRESH WATER	■	DEADWEIGHT	0 LT	MEAN	11.47 FT	GM AVAILABLE	288.20 FT	
		DISPLACEMENT	58840 LT	AFT	17.70 FT	GM REQUIRED	FT	

CONTENT	LINE NO.	TANK		(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P. 18)
CARGO OR S.W. BALLAST	①	CTR NO. 1				115.85		49.32		
	②	CTR NO. 2				223.34		49.30		
	③	CTR NO. 3				330.83		49.30		
	④	CTR NO. 5				581.67		49.30		
	⑤	CTR NO. 6				689.17		49.30		
	⑥	CTR NO. 7				796.67		49.30		
	⑦	CTR NO. 8				914.00		53.95		
	⑧	WG NO. 1	P/S			119.55		53.81		
	⑨	WG NO. 2	P/S			188.63		50.70		
	⑩	WG NO. 3	P/S			259.37		49.00		
	⑪	WG NO. 4	P/S			330.86		48.40		
	⑫	WG NO. 5	P/S			402.50		48.35		
	⑬	WG NO. 6	P/S			474.17		48.35		
	⑭	WG NO. 7	P/S			545.83		48.35		
	⑮	WG NO. 8	P/S			617.50		48.35		
	⑯	WG NO. 9	P/S			689.17		48.35		
	⑰	WG NO. 10	P/S			760.80		48.42		
	⑱	WG NO. 11	P/S			832.18		49.32		
	⑲	WG NO. 12	P/S			902.87		52.62		
F.O.	⑳	STORAGE	P/S			972.81		61.20		
	㉑	SETTLERS	P/S			981.64		73.66		
	㉒	LOW SULFUR	S			1018.44		70.52		
	㉓	DIESEL OIL	P			1018.47		87.70		
	㉔	LUBE OIL				1048.32		92.12		
F.W.	㉕	DISTILLED	P			1003.75		86.29		
	㉖	POTABLE	S			1003.75		86.29		
S.W.B.	㉗	FOREPEAK				49.79		50.23		
	㉘	CTR NO. 4				438.33		49.30		
	㉙	S.W. BALLAST WG	P			1048.60		75.43		
	㉚	S.W. BALLAST WG	S			1052.62		77.51		
	㉛	DOUBLE BOTTOM				1026.43		6.41		
	㉜	AFTER PEAK				1122.09		67.28		
	㉝	CREW & STORES				1011.00		128.46		
	㉞	LIGHT SHIP			58840	604.53	35570545	66.50	3912860	
	㉟	TOTALS [SUM ①-㉞]			58840	604.53	35570545	66.50	3912860	0

CONDITION: NO. 1
LIGHT SHIP

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	58840	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	472.0	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	604.53	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	532.30	FT
㊵	TRIM LEVER	[㊳-㊴, -FWD/+AFT]	72.23	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	28400	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), -FWD/+AFT]	12.47	FT
㊸	L.C.F. AFT F.P.	[FROM P. 22]	535.05	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P. 22]	11.05	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	5.82	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	5.23	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	17.70	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	11.47	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

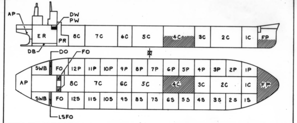
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	354.70	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	66.50	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	288.20	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	0.	FT
(54)	AVAILABLE GM	[(52)-(53)]	288.20	FT
(55)	REQUIRED GM	[FROM P. 20]	—	FT
(56)	IS (54) ≥ (55)? ☐ YES ☐ NO (SEE NOTE 2)			

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:		CARGO OIL	0 LT	LCG AFT FP	540.39 FT	STABILITY:		CONDITION: NO. 2 DOCKING
CARGO OIL	▤	FUEL OIL	600 LT	TRIM	1.79 FT	KM	266.00 FT	
FUEL OIL	▥	S.W. BALLAST	22500 LT	MT 1"	29900 FT-TONS	KG	62.04 FT	
S.W. BALLAST	▨	FRESH WATER	200 LT	TPI	482.0	GM	203.96 FT	
DIESEL OIL	■	MISC. DWT.	214 LT	DRAFT, FWD	14.37 FT	FREE SURF. CORR.	5.03 FT	
FRESH WATER	■	DEADWEIGHT	23514 LT	MEAN	15.27 FT	GM AVAILABLE	198.93 FT	
		DISPLACEMENT	82354 LT	AFT	16.16 FT	GM REQUIRED	110.00 FT	

CONTENT	LINE NO.	TANK		(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P. 18)
CARGO OR S.W. BALLAST	①	CTR NO. 1				115.85		49.32		
	②	CTR NO. 2				223.34		49.30		
	③	CTR NO. 3				330.83		49.30		
	④	CTR NO. 5				581.67		49.30		
	⑤	CTR NO. 6				689.17		49.30		
	⑥	CTR NO. 7				796.67		49.30		
	⑦	CTR NO. 8				914.00		53.95		
	⑧	WG NO. 1	P/S			119.55		53.81		
	⑨	WG NO. 2	P/S			188.63		50.70		
	⑩	WG NO. 3	P/S			259.37		49.00		
	⑪	WG NO. 4	P/S			330.86		48.40		
	⑫	WG NO. 5	P/S			402.50		48.35		
	⑬	WG NO. 6	P/S			474.17		48.35		
	⑭	WG NO. 7	P/S			545.83		48.35		
	⑮	WG NO. 8	P/S			617.50		48.35		
	⑯	WG NO. 9	P/S			689.17		48.35		
	⑰	WG NO. 10	P/S			760.80		48.42		
	⑱	WG NO. 11	P/S			832.18		49.32		
	⑲	WG NO. 12	P/S			902.87		52.62		
F.O.	⑳	STORAGE	P/S			972.81		61.20		
	㉑	SETTLERS	P/S		500	981.64	490820	73.66	36830	1046
	㉒	LOW SULFUR	S		100	1018.44	101844	70.52	7052	4814
	㉓	DIESEL OIL	P		100	1018.47	101847	87.70	8770	3917
	㉔	LUBE OIL			64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED	P		100	1003.75	100375	86.29	8629	6367
	㉖	POTABLE	S		100	1003.75	100375	86.29	8629	280
S.W.B.	㉗	FOREPEAK			5000	49.79	248950	50.23	251150	234179
	㉘	CTR NO. 4			17500	438.33	7670775	49.30	862750	164018
	㉙	S.W. BALLAST WG	P			1048.60		75.43		
	㉚	S.W. BALLAST WG	S			1052.62		77.51		
	㉛	DOUBLE BOTTOM				1026.43		6.41		
	㉜	AFTER PEAK				1122.09		67.28		
	㉝	CREW & STORES			50	1011.00	50550	128.46	6423	
	㉞	LIGHT SHIP			58840	604.53	35570545	66.50	3912860	
	㉟	TOTALS [SUM ①-㉞]			82354	540.39	44500173	62.04	5108989	414205

CONDITION: NO. 2
DOCKING

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	82354	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	482.0	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	540.39	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	532.60	FT
㊵	TRIM LEVER	[㊳-㊴, -FWD/+AFT]	7.79	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	29900	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), -FWD/+AFT]	1.79	FT
㊸	L.C.F. AFT F.P.	[FROM P. 22]	533.62	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P. 22]	15.20	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	0.83	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	14.37	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	16.16	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	15.27	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

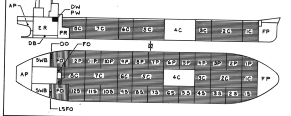
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	266.00	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	62.04	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	203.96	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	5.03	FT
(54)	AVAILABLE GM	[(52)-(53)]	198.93	FT
(55)	REQUIRED GM	[FROM P. 20]	110.00	FT
(56)	IS (54) ≥ (55)? ☒ YES ☐ NO (SEE NOTE 2)			

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:		CARGO OIL	379579 LT	LCG AFT FP	554.11 FT	STABILITY:		CONDITION: NO. 3 FULL LOAD DEPARTURE 98% F.O. CARGO @ 44.38 FT³/LT
CARGO OIL	▤	FUEL OIL	17735 LT	TRIM	5.25 FT	KM	95.30 FT	
FUEL OIL	▥	S.W. BALLAST	0 LT	MT 1"	45050 FT-TONS	KG	52.26 FT	
S.W. BALLAST	▨	FRESH WATER	623 LT	TPI	558.0	GM	43.04 FT	
DIESEL OIL	■	MISC. DWT.	339 LT	DRAFT, FWD	72.40 FT	FREE SURF. CORR.	3.59 FT	
FRESH WATER	■	DEADWEIGHT	398276 LT	MEAN	75.03 FT	GM AVAILABLE	39.45 FT	
		DISPLACEMENT	457116 LT	AFT	77.65 FT	GM REQUIRED	29.90 FT	

CONTENT	LINE NO.	TANK		(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P. 18)
CARGO OR S.W. BALLAST	①	CTR NO. 1		95474	12079	115.85	1399352	49.32	595736	49076
	②	CTR NO. 2		190745	24133	223.34	5389864	49.30	1189757	98154
	③	CTR NO. 3		95220	12047	330.83	3985509	49.30	593917	49076
	④	CTR NO. 5		189743	24006	581.67	13963530	49.30	1183496	98154
	⑤	CTR NO. 6		95028	12023	689.17	8285891	49.30	592734	49076
	⑥	CTR NO. 7		190105	24052	796.67	19161507	49.30	1185764	98154
	⑦	CTR NO. 8		117191	14827	914.00	13551878	53.95	799917	71900
	⑧	WG NO. 1	P/S	110462	13976	119.55	1670831	53.81	752049	42744
	⑨	WG NO. 2	P/S	159374	20164	188.63	3803535	50.70	1022315	81284
	⑩	WG NO. 3	P/S	175924	22258	259.37	5773087	49.00	1090642	88806
	⑪	WG NO. 4	P/S	178758	22614	330.86	7482068	48.40	1094518	88806
	⑫	WG NO. 5	P/S	178906	22635	402.50	9110588	48.35	1094402	88806
	⑬	WG NO. 6	P/S	178906	22635	474.17	10732838	48.35	1094402	88806
	⑭	WG NO. 7	P/S	178884	22633	545.83	12353770	48.35	1094305	88806
	⑮	WG NO. 8	P/S	178906	22635	617.50	13977113	48.35	1094402	88806
	⑯	WG NO. 9	P/S	178906	22635	689.17	15599363	48.35	1094402	88806
	⑰	WG NO. 10	P/S	178662	22604	760.80	17197123	48.42	1094486	88806
	⑱	WG NO. 11	P/S	174428	22069	832.18	18365330	49.32	1088443	88806
	⑲	WG NO. 12	P/S	154549	19554	902.87	17654120	52.62	1028931	86640
F.O.	⑳	STORAGE	P/S		16107	972.81	15669051	61.20	985748	103124
	㉑	SETTLERS	P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR	S		641	1018.44	652820	70.52	45203	4814
	㉓	DIESEL OIL	P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL			64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED	P		461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE	S		162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK				49.79		50.23		
	㉘	CTR NO. 4				438.33		49.30		
	㉙	S.W. BALLAST WG	P			1048.60		75.43		
	㉚	S.W. BALLAST WG	S			1052.62		77.51		
	㉛	DOUBLE BOTTOM				1026.43		6.41		
	㉜	AFTER PEAK				1122.09		67.28		
	㉝	CREW & STORES			50	1011.00	50550	128.46	6423	
	㉞	LIGHT SHIP			58840	604.53	35570545	66.50	3912860	
	㉟	TOTALS [SUM ①-㉞]			457116	554.11	253291387	52.26	23886942	1642534

CONDITION: NO. 3
FULL LOAD DEPARTURE
98% F.O.
CARGO @ 44.38 FT³/LT

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	457116	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	558.00	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	554.11	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	547.90	FT
㊵	TRIM LEVER	[㊳-㊴, -FWD/+AFT]	6.21	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	45050	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), -FWD/+AFT]	5.25	FT
㊸	L.C.F. AFT F.P.	[FROM P. 22]	577.10	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P. 22]	75.05	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	2.65	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	72.40	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	77.65	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	75.03	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	95.30	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	52.26	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	43.04	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	3.59	FT
(54)	AVAILABLE GM	[(52)-(53)]	39.45	FT
(55)	REQUIRED GM	[FROM P. 20]	29.90	FT
(56)	IS (54) ≥ (55)? ☒ YES ☐ NO (SEE NOTE 2)			

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S

0100-758

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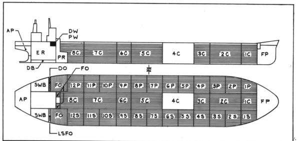
SEPT. '80

FRAME

8X



LOADING KEY:	
CARGO OIL	▤
FUEL OIL	▥
S.W. BALLAST	▨
DIESEL OIL	■
FRESH WATER	■

CARGO OIL 379579 LT
FUEL OIL 9362 LT
S.W. BALLAST 0 LT
FRESH WATER 623 LT
MISC. DWT. 339 LT
DEADWEIGHT 389903 LT
DISPLACEMENT 448743 LT

LCG AFT FP 546.29 FT
TRIM -1.01 FT
MT 1" 44800 FT-TON
TPI 557.0
DRAFT, FWD 74.42 FT
MEAN 73.92 FT
AFT 73.41 FT

STABILITY:
KM 95.50 FT
KG 52.09 FT
GM 43.41 FT
FREE SURF. CORR. 3.66 FT
GM AVAILABLE 39.75 FT
GM REQUIRED 28.60 FT

CONDITION: NO. 4
FULL LOAD ARRIVAL
50% F.O.
CARGO @ 44.38 FT³/LT

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO. 1	95474	12079	115.85	1399352	49.32	595736	49076
	②	CTR NO. 2	190745	24133	223.34	5389804	49.30	1189757	98154
	③	CTR NO. 3	95220	12047	330.83	3985509	49.30	593917	49076
	④	CTR NO. 5	189743	24006	581.67	13963570	49.30	1183496	98154
	⑤	CTR NO. 6	95028	12023	689.17	8285891	49.30	592734	49076
	⑥	CTR NO. 7	190105	24052	796.67	19161507	49.30	1185764	98154
	⑦	CTR NO. 8	117191	14827	914.00	13551878	53.95	799917	71900
	⑧	WG NO. 1 P/S	110462	13976	119.55	1670831	53.81	752049	42744
	⑨	WG NO. 2 P/S	159374	20164	188.63	3803535	50.70	1022315	81284
	⑩	WG NO. 3 P/S	175924	22258	259.37	5773057	49.00	1090642	88306
	⑪	WG NO. 4 P/S	178738	22614	330.86	7482068	48.40	1094518	88306
	⑫	WG NO. 5 P/S	178906	22635	402.50	9110588	48.35	1094402	88306
	⑬	WG NO. 6 P/S	178906	22635	474.17	10732888	48.35	1094402	88306
	⑭	WG NO. 7 P/S	178884	22633	545.83	12353710	48.35	1094305	88306
	⑮	WG NO. 8 P/S	178906	22635	617.50	13977113	48.35	1094402	88306
	⑯	WG NO. 9 P/S	178906	22635	689.17	15599363	48.35	1094402	88306
	⑰	WG NO. 10 P/S	178662	22604	760.80	17197123	48.42	1094486	88306
	⑱	WG NO. 11 P/S	174428	22069	832.18	18365380	49.32	1088443	88306
	⑲	WG NO. 12 P/S	154549	19554	902.87	17654720	52.62	1028931	86640
F.O.	⑳	STORAGE P/S		7734	972.81	7523713	61.20	473321	103124
	㉑	SETTLERS P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR S		641	1018.44	652820	70.52	45203	6314
	㉓	DIESEL OIL P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		461	1003.75	462727	86.29	39780	6347
	㉖	POTABLE S		162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK			49.79		50.23		
	㉘	CTR NO. 4			438.33		49.30		
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	═
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	═
	㉟	TOTALS [SUM ①-㉞]		448743	546.29	245146049	52.09	23374515	1642584

CONDITION: NO. 4
FULL LOAD ARRIVAL
50% F.O.
CARGO @ 44.38 FT³/LT

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL. (B)]	448743	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	557.00	
㊳	L.C.G. AFT F.P.	[LINE ㉟, (D)÷(B)]	546.29	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	547.40	FT
㊵	TRIM LEVER	[㊳-㊴, −FWD / +AFT]	-1.11	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	44800	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), −FWD / +AFT]	-1.01	FT
㊸	L.C.F. AFT F.P.	[FROM P. 22]	576.50	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P. 22]	73.91	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	-0.51	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	74.42	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	73.41	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	7392	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

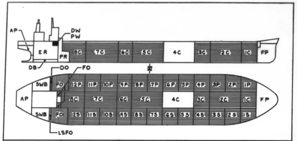
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	95.50	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟, (F)÷(B)]	52.09	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	43.41	FT
(53)	FREE SURF. CORR.	[LINE ㉟, (G)÷(B)]	3.66	FT
(54)	AVAILABLE GM	[(52)-(53)]	39.75	FT
(55)	REQUIRED GM	[FROM P. 20]	28.60	FT
(56)	IS (54) ≥ (55)?	☒ YES ☐ NO (SEE NOTE 2)		

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:	
CARGO OIL	▤
FUEL OIL	▥
S.W. BALLAST	▨
DIESEL OIL	■
FRESH WATER	■

CARGO OIL 387659 LT
FUEL OIL 9362 LT
S.W. BALLAST 0 LT
FRESH WATER 623 LT
MISC. DWT. 339 LT
DEADWEIGHT 397983 LT
DISPLACEMENT 456823 LT

LCG AFT FP 545.93 FT
TRIM -1.66 FT
MT 1" 45050 FT-TON
TPI 558.0
DRAFT, FWD 75.86 FT
MEAN 75.03 FT
AFT 74.20 FT

STABILITY:
KM 95.30 FT
KG 52.04 FT
GM 43.26 FT
FREE SURF. CORR. 3.66 FT
GM AVAILABLE 39.60 FT
GM REQUIRED 29.90 FT

CONDITION: NO. 5
FULL LOAD DEPARTURE
50% F.O.
CARGO @ 43.46 FT³/LT

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO. 1	95474	12337	115.85	1429241	49.32	608461	50002
	②	CTR NO. 2	190745	24647	223.34	5504661	49.30	1215097	100006
	③	CTR NO. 3	95220	12304	330.83	4070532	49.30	606587	50002
	④	CTR NO. 5	189743	24517	581.67	14260803	49.30	1208688	100006
	⑤	CTR NO. 6	95028	12279	689.17	8462318	49.30	605355	50002
	⑥	CTR NO. 7	190105	24564	796.67	19569402	49.30	1211005	100006
	⑦	CTR NO. 8	117191	15143	914.00	13840702	53.95	816965	73256
	⑧	WG NO. 1 P/S	110462	14273	119.55	1706337	53.81	768030	43551
	⑨	WG NO. 2 P/S	159374	20593	188.63	3884458	50.70	1044065	82817
	⑩	WG NO. 3 P/S	175924	22732	259.37	5895999	49.00	1113868	90482
	⑪	WG NO. 4 P/S	178738	23095	330.86	7641212	48.40	1117798	90482
	⑫	WG NO. 5 P/S	178906	23117	402.50	9304593	48.35	1117707	90482
	⑬	WG NO. 6 P/S	178906	23117	474.17	10961388	48.35	1117707	90482
	⑭	WG NO. 7 P/S	178884	23114	545.83	12616315	48.35	1117562	90482
	⑮	WG NO. 8 P/S	178906	23117	617.50	14274748	48.35	1117707	90482
	⑯	WG NO. 9 P/S	178906	23117	689.17	15931543	48.35	1117707	90482
	⑰	WG NO. 10 P/S	178662	23085	760.80	17563068	48.42	1117776	90482
	⑱	WG NO. 11 P/S	174428	22538	832.18	18755673	49.32	1111574	90482
	⑲	WG NO. 12 P/S	154549	19970	902.87	18030814	52.62	1050821	88279
F.O.	⑳	STORAGE P/S		7734	972.81	7523713	61.20	473321	103124
	㉑	SETTLERS P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR S		641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		461	1003.75	462729	86.29	39780	6347
	㉖	POTABLE S		162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK			49.79		50.23		
	㉘	CTR NO. 4			438.33		49.30		
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	═
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	═
	㉟	TOTALS [SUM ①-㉞]		456823	545.93	249391899	52.04	23774377	1671337

CONDITION: NO. 5
FULL LOAD DEPARTURE
50% F.O.
CARGO @ 43.46 FT³/LT

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL. (B)]	456823	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	558.00	
㊳	L.C.G. AFT F.P.	[LINE ㉟, (D)÷(B)]	545.93	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	547.90	FT
㊵	TRIM LEVER	[㊳-㊴, −FWD / +AFT]	-1.97	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	45050	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), −FWD / +AFT]	-1.66	FT
㊸	L.C.F. AFT F.P.	[FROM P. 22]	577.10	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P. 22]	75.02	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	-0.84	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	75.86	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	74.20	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	75.03	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

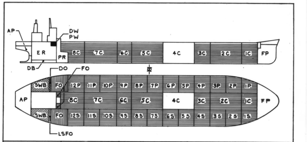
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	95.30	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟, (F)÷(B)]	52.04	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	43.26	FT
(53)	FREE SURF. CORR.	[LINE ㉟, (G)÷(B)]	3.66	FT
(54)	AVAILABLE GM	[(52)-(53)]	39.60	FT
(55)	REQUIRED GM	[FROM P. 20]	29.90	FT
(56)	IS (54) ≥ (55)?	☒ YES ☐ NO (SEE NOTE 2)		

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:	
CARGO OIL	▤
FUEL OIL	▥
S.W. BALLAST	▨
DIESEL OIL	■
FRESH WATER	■

CARGO OIL 387659 LT
FUEL OIL 2385 LT
S.W. BALLAST 6852 LT
FRESH WATER 623 LT
MISC. DWT. 339 LT
DEADWEIGHT 397858 LT
DISPLACEMENT 456698 LT

LCG AFT FP 546.97 FT
TRIM – 0.79 FT
MT 1" 45050 FT-TON
TPI 557.90
DRAFT, FWD 75.38 FT
MEAN 74.99 FT
AFT 74.59 FT

STABILITY:
KM 95.30 FT
KG 52.27 FT
GM 43.03 FT
FREE SURF. CORR. 3.66 FT
GM AVAILABLE 39.37 FT
GM REQUIRED 29.75 FT

CONDITION: NO. 6
FULL LOAD ARRIVAL
10% F.O.
CARGO @ 43.46 FT³/LT

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO. 1	95474	12337	115.85	1429241	49.32	608461	50002
	②	CTR NO. 2	190745	24647	223.34	5504661	49.30	1215097	100006
	③	CTR NO. 3	95220	12304	330.83	4070532	49.30	606587	50002
	④	CTR NO. 5	189743	24517	581.67	14260803	49.30	1208688	100006
	⑤	CTR NO. 6	95028	12279	689.17	8462318	49.30	605355	50002
	⑥	CTR NO. 7	190105	24564	796.67	19569402	49.30	1211005	100006
	⑦	CTR NO. 8	117191	15143	914.00	13840702	53.95	816965	73256
	⑧	WG NO. 1 P/S	110462	14273	119.55	1706337	53.81	768030	43551
	⑨	WG NO. 2 P/S	159374	20593	188.63	3884458	50.70	1044065	82817
	⑩	WG NO. 3 P/S	175924	22732	259.37	5895999	49.00	1113868	90482
	⑪	WG NO. 4 P/S	178738	23095	330.86	7641212	48.40	1117798	90482
	⑫	WG NO. 5 P/S	178906	23117	402.50	9304593	48.35	1117707	90482
	⑬	WG NO. 6 P/S	178906	23117	474.17	10961388	48.35	1117707	90482
	⑭	WG NO. 7 P/S	178884	23114	545.83	12616315	48.35	1117562	90482
	⑮	WG NO. 8 P/S	178906	23117	617.50	14274748	48.35	1117707	90482
	⑯	WG NO. 9 P/S	178906	23117	689.17	15931543	48.35	1117707	90482
	⑰	WG NO. 10 P/S	178660	23085	760.80	17563068	48.42	1117776	90482
	⑱	WG NO. 11 P/S	174428	22538	832.18	18755673	49.32	1111574	90482
	⑲	WG NO. 12 P/S	154549	19970	902.87	18030814	52.62	1050821	88279
F.O.	⑳	STORAGE P/S		757	972.81	736417	61.20	46328	103124
	㉑	SETTLERS P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR S		641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		461	1003.75	462729	86.29	39780	6347
	㉖	POTABLE S		162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK			49.79		50.23		
	㉘	CTR NO. 4			438.33		49.30		
	㉙	S.W. BALLAST WG P		3640	1048.60	3816904	75.43	274565	═
	㉚	S.W. BALLAST WG S		3212	1052.62	3381015	77.51	248962	═
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	═
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	═
	㉟	TOTALS [SUM ①-㉞]		456698	546.97	249802022	52.27	23870910	1671337

CONDITION: NO. 6
FULL LOAD ARRIVAL
10% F.O.
CARGO @ 43.46 FT³/LT

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL. (B)]	456698	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	557.90	
㊳	L.C.G. AFT F.P.	[LINE ㉟, (D)÷(B)]	546.97	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	547.90	FT
㊵	TRIM LEVER	[㊳-㊴, −FWD / +AFT]	-0.93	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	45050	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), −FWD / +AFT]	-0.79	FT
㊸	L.C.F. AFT F.P.	[FROM P. 22]	577.20	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P. 22]	74.98	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	-0.40	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	75.38	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	74.59	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	74.99	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

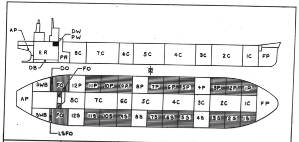
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	95.30	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟, (F)÷(B)]	52.27	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	43.03	FT
(53)	FREE SURF. CORR.	[LINE ㉟, (G)÷(B)]	3.66	FT
(54)	AVAILABLE GM	[(52)-(53)]	39.37	FT
(55)	REQUIRED GM	[FROM P. 20]	29.75	FT
(56)	IS (54) ≥ (55)?	☒ YES ☐ NO (SEE NOTE 2)		

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:	
CARGO OIL	▤
FUEL OIL	▥
S.W. BALLAST	▨
DIESEL OIL	■
FRESH WATER	■

CARGO OIL 193264 LT
FUEL OIL 17735 LT
S.W. BALLAST 0 LT
FRESH WATER 623 LT
MISC. DWT. 339 LT
DEADWEIGHT 211961 LT
DISPLACEMENT 270801 LT

LCG AFT FP 551.17 FT
TRIM 8.62 FT
MT 1" 36480 FT-TON
TPI 520.2
DRAFT, FWD 42.29 FT
MEAN 46.60 FT
AFT 50.91 FT

STABILITY:
KM 112.50 FT
KG 53.95 FT
GM 58.55 FT
FREE SURF. CORR. 3.21 FT
GM AVAILABLE 55.34 FT
GM REQUIRED 18. FT

CONDITION: NO. 7
50% CARGO
98% F.O.
CARGO @ 44.00 FT³/LT

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO. 1			115.85		49.32		
	②	CTR NO. 2			223.34		49.30		
	③	CTR NO. 3			330.83		49.30		
	④	CTR NO. 5			581.67		49.30		
	⑤	CTR NO. 6			689.17		49.30		
	⑥	CTR NO. 7			796.67		49.30		
	⑦	CTR NO. 8			914.00		53.95		
	⑧	WG NO. 1 P/S	110462	14096	119.55	1685177	53.81	758506	43017
	⑨	WG NO. 2 P/S	159374	20338	188.63	3836357	50.70	1031157	81801
	⑩	WG NO. 3 P/S	175924	22450	259.37	5822857	49.00	1100050	89372
	⑪	WG NO. 4 P/S			330.86		48.40		
	⑫	WG NO. 5 P/S	178906	22831	402.50	9189478	48.35	1103879	89372
	⑬	WG NO. 6 P/S	178906	22831	474.17	10825775	48.35	1103879	89372
	⑭	WG NO. 7 P/S	178884	22828	545.83	12460207	48.35	1103734	89372
	⑮	WG NO. 8 P/S			617.50		48.35		
	⑯	WG NO. 9 P/S	178906	22831	689.17	15734440	48.35	1103879	89372
	⑰	WG NO. 10 P/S	178662	22800	760.80	17346240	48.42	1103976	89372
	⑱	WG NO. 11 P/S	174428	22259	832.18	18523495	49.32	1097814	89372
	⑲	WG NO. 12 P/S			902.87		52.62		
F.O.	⑳	STORAGE P/S		16107	972.81	15669051	61.20	985748	103124
	㉑	SETTLERS P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR S		641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		461	1003.75	462729	86.29	39780	6347
	㉖	POTABLE S		162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK			49.79		50.23		
	㉘	CTR NO. 4			438.33		49.30		
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	═
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	═
	㉟	TOTALS [SUM ①-㉞]		270801	551.17	149257456	53.95	14609178	849494

CONDITION: NO. 7
50% CARGO
98% F.O.
CARGO @ 44.00 FT³/LT

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL. (B)]	270801	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	520.2	
㊳	L.C.G. AFT F.P.	[LINE ㉟, (D)÷(B)]	551.17	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	537.23	FT
㊵	TRIM LEVER	[㊳-㊴, −FWD / +AFT]	13.94	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	36480	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), −FWD / +AFT]	8.62	FT
㊸	L.C.F. AFT F.P.	[FROM P. 22]	548.00	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P. 22]	46.42	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	4.13	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	42.29	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	50.91	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	46.60	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

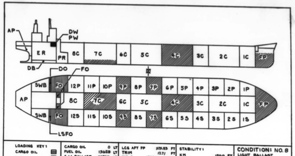
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	112.50	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟, (F)÷(B)]	53.95	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	58.55	FT
(53)	FREE SURF. CORR.	[LINE ㉟, (G)÷(B)]	3.21	FT
(54)	AVAILABLE GM	[(52)-(53)]	55.34	FT
(55)	REQUIRED GM	[FROM P. 20]	18.	FT
(56)	IS (54) ≥ (55)?	☒ YES ☐ NO (SEE NOTE 2)		

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:	
CARGO OIL	▤
FUEL OIL	▥
S.W. BALLAST	▨
DIESEL OIL	■
FRESH WATER	■

CARGO OIL 0 LT
FUEL OIL 13628 LT
S.W. BALLAST 95985 LT
FRESH WATER 623 LT
MISC. DWT. 339 LT
DEADWEIGHT 110575 LT
DISPLACEMENT 169415 LT

LCG AFT FP 575.83 FT
TRIM 17.71 FT
MT 1" 33300 FT-TON
TPI 503.1
DRAFT, FWD 21.66 FT
MEAN 30.52 FT
AFT 39.37 FT

STABILITY:
KM 150.0 FT
KG 56.36 FT
GM 93.64 FT
FREE SURF. CORR. 5.54 FT
GM AVAILABLE 88.10 FT
GM REQUIRED 31.0 FT

CONDITION: NO. 8
LIGHT BALLAST
76% F.O.

0100-758
MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
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SEPT. '80
8X
FRAME

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P. 18)
CARGO OR S.W. BALLAST	①	CTR NO. 1			115.85		49.32		
	②	CTR NO. 2			222.34		49.30		
	③	CTR NO. 3			330.83		49.30		
	④	CTR NO. 5			581.67		49.30		
	⑤	CTR NO. 6			689.17		49.30		
	⑥	CTR NO. 7		3750	796.67	2987513	49.30	184875	164078
	⑦	CTR NO. 8			914.00		53.95		
	⑧	WG NO. 1 P/S			119.55		53.81		
	⑨	WG NO. 2 P/S			188.63		50.70		
	⑩	WG NO. 3 P/S			259.31		49.00		
	⑪	WG NO. 4 P/S			330.86		48.40		
	⑫	WG NO. 5 P/S			402.50		48.35		
	⑬	WG NO. 6 P/S			474.17		48.35		
	⑭	WG NO. 7 P/S		20000	545.83	10916600	48.35	967000	145204
	⑮	WG NO. 8 P/S			617.50		48.35		
	⑯	WG NO. 9 P/S		28702	689.17	19780557	48.35	1387742	112355
	⑰	WG NO. 10 P/S			760.80		48.42		
	⑱	WG NO. 11 P/S			832.18		49.32		
	⑲	WG NO. 12 P/S			902.87		52.62		
F.O.	⑳	STORAGE P/S		12000	972.81	11673720	61.20	734400	103124
	㉑	SETTLERS P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR S		641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE S		162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK		13000	49.79	647270	50.23	652990	234179
	㉘	CTR NO. 4		30533	438.33	13383530	49.30	1505277	164078
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	——
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	——
	㉟	TOTALS [SUM ①-㉞]		169415	575.83	97553569	56.36	9548860	938934

CONDITION: NO. 8
LIGHT BALLAST
70 % F.O.

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL. (B)]	169415	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	503.1	
㊳	L.C.G. AFT F.P.	[LINE ㉟, (D) ÷ (B)]	575.83	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	534.05	FT
㊵	TRIM LEVER	[㊳ − ㊴, −FWD +AFT]	41.78	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	33300	FT-TONS
㊷	TRIM	[㊱ × ㊵ ÷ (12 × ㊶), −FWD +AFT]	17.71	FT
㊸	L.C.F. AFT F.P.	[FROM P. 22]	538.20	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P. 22]	30.00	FT
㊺	TRIM APPLIED FWD	[㊷ × ㊸ ÷ 1143]	8.34	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹ − ㊺]	21.66	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻ + ㊷]	39.37	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻ + ㊼) ÷ 2]	30.52	FT
㊾	IF ㊽ < 65 FT, IS −10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS −10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

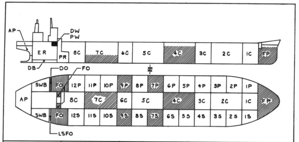
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	150.00	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟, (F) ÷ (B)]	56.36	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿ − (51)]	93.64	FT
(53)	FREE SURF. CORR.	[LINE ㉟, (G) ÷ (B)]	5.54	FT
(54)	AVAILABLE GM	[(52) − (53)]	88.10	FT
(55)	REQUIRED GM	[FROM P. 20]	31.	FT
(56)	IS (54) ≥ (55)? ☒ YES ☐ NO (SEE NOTE 2)			

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:
CARGO OIL ▤
FUEL OIL ▥
S.W. BALLAST ▨
DIESEL OIL ■
FRESH WATER ■

CARGO OIL	0	LT
FUEL OIL	9362	LT
S.W. BALLAST	96702	LT
FRESH WATER	623	LT
MISC. DWT.	339	LT
DEADWEIGHT	107026	LT
DISPLACEMENT	165866	LT

LCG AFT FP	578.52	FT
TRIM	18.54	FT
MT 1"	33200	FT-TONS
T P I	502.5	
DRAFT, FWD	20.69	FT
MEAN	29.96	FT
AFT	39.23	FT

STABILITY:

KM	152.53	FT
KG	56.21	FT
GM	96.09	FT
FREE SURF. CORR.	5.66	FT
GM AVAILABLE	90.43	FT
GM REQUIRED	31.0	FT

CONDITION: NO. 9
LIGHT BALLAST
50% F.O.

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P. 18)
CARGO OR S.W. BALLAST	①	CTR NO. 1			115.85		49.32		
	②	CTR NO. 2			222.34		49.30		
	③	CTR NO. 3			330.83		49.30		
	④	CTR NO. 5			581.67		49.30		
	⑤	CTR NO. 6			689.17		49.30		
	⑥	CTR NO. 7		10000	796.67	7966700	49.30	493000	164078
	⑦	CTR NO. 8			914.00		53.95		
	⑧	WG NO. 1 P/S			119.55		53.81		
	⑨	WG NO. 2 P/S			188.63		50.70		
	⑩	WG NO. 3 P/S			259.31		49.00		
	⑪	WG NO. 4 P/S			330.86		48.40		
	⑫	WG NO. 5 P/S			402.50		48.35		
	⑬	WG NO. 6 P/S			474.17		48.35		
	⑭	WG NO. 7 P/S		20000	545.83	10916600	48.35	967000	145204
	⑮	WG NO. 8 P/S			617.50		48.35		
	⑯	WG NO. 9 P/S		28702	689.17	19780557	48.35	1387742	112355
	⑰	WG NO. 10 P/S			760.80		48.42		
	⑱	WG NO. 11 P/S			832.18		49.32		
	⑲	WG NO. 12 P/S			902.87		52.62		
F.O.	⑳	STORAGE P/S		7734	972.81	7523713	61.20	473321	103124
	㉑	SETTLERS P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR S		641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE S		162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK		13000	49.79	647270	50.23	652990	234179
	㉘	CTR NO. 4		25000	438.33	10958250	49.30	1232500	164078
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	——
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	——
	㉟	TOTALS [SUM ①-㉞]		165866	578.52	95957469	56.21	9323127	938964

CONDITION: NO. 9
LIGHT BALLAST
50% F.O.

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL. (B)]	165866	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	502.5	
㊳	L.C.G. AFT F.P.	[LINE ㉟, (D) ÷ (B)]	578.52	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	533.98	FT
㊵	TRIM LEVER	[㊳ − ㊴, −FWD +AFT]	44.54	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	33200	FT-TONS
㊷	TRIM	[㊱ × ㊵ ÷ (12 × ㊶), −FWD +AFT]	18.54	FT
㊸	L.C.F. AFT F.P.	[FROM P. 22]	537.95	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P. 22]	29.42	FT
㊺	TRIM APPLIED FWD	[㊷ × ㊸ ÷ 1143]	8.73	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹ − ㊺]	20.69	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻ + ㊷]	39.23	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻ + ㊼) ÷ 2]	29.96	FT
㊾	IF ㊽ < 65 FT, IS −10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS −10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

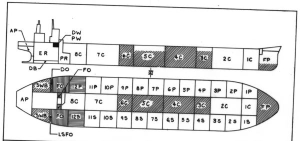
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	152.30	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟, (F) ÷ (B)]	56.21	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿ − (51)]	96.09	FT
(53)	FREE SURF. CORR.	[LINE ㉟, (G) ÷ (B)]	5.66	FT
(54)	AVAILABLE GM	[(52) − (53)]	90.43	FT
(55)	REQUIRED GM	[FROM P. 20]	31.	FT
(56)	IS (54) ≥ (55)? ☒ YES ☐ NO (SEE NOTE 2)			

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:
CARGO OIL ▤
FUEL OIL ▥
S.W. BALLAST ▨
DIESEL OIL ■
FRESH WATER ■

CARGO OIL	4000	LT
FUEL OIL	9362	LT
S.W. BALLAST	90528	LT
FRESH WATER	623	LT
MISC. DWT.	339	LT
DEADWEIGHT	104852	LT
DISPLACEMENT	163692	LT

LCG AFT FP	580.28	FT
TRIM	19.10	FT
MT 1"	33130	FT-TONS
T P I	502.0	
DRAFT, FWD	20.02	FT
MEAN	29.57	FT
AFT	39.12	FT

STABILITY:

KM	154.00	FT
KG	57.11	FT
GM	96.89	FT
FREE SURF. CORR.	6.16	FT
GM AVAILABLE	90.73	FT
GM REQUIRED	32.0	FT

CONDITION: NO. 10
LIGHT CLEANED
BALLAST WITH SLOPS
50 % F.O.

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P. 18)
CARGO OR S.W. BALLAST	①	CTR NO. 1			115.85		49.32		
	②	CTR NO. 2			222.34		49.30		
	③	CTR NO. 3		14000	330.83	4631620	49.30	690200	92089
	④	CTR NO. 5		23750	581.67	13814663	49.30	1170875	164078
	⑤	CTR NO. 6		15245	689.17	10506397	49.30	751579	62089
	⑥	CTR NO. 7			796.67		49.30		
	⑦	CTR NO. 8			914.00		53.95		
	⑧	WG NO. 1 P/S			119.55		53.81		
	⑨	WG NO. 2 P/S			188.63		50.70		
	⑩	WG NO. 3 P/S			259.31		49.00		
	⑪	WG NO. 4 P/S			330.86		48.40		
	⑫	WG NO. 5 P/S			402.50		48.35		
	⑬	WG NO. 6 P/S			474.17		48.35		
	⑭	WG NO. 7 P/S			545.83		48.35		
	⑮	WG NO. 8 P/S			617.50		48.35		
	⑯	WG NO. 9 P/S			689.17		48.35		
	⑰	WG NO. 10 P/S			760.80		48.42		
	⑱	WG NO. 11 P/S			832.18		49.32		
	⑲	WG NO. 12 P/S		4000	902.87	3611480	52.62	210480	141668
F.O.	⑳	STORAGE P/S		7734	972.81	7523713	61.20	473321	103124
	㉑	SETTLERS P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR S		641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE S		162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK		4000	49.79	199160	50.23	200920	234179
	㉘	CTR NO. 4		30533	438.33	13383530	49.30	1505277	164078
	㉙	S.W. BALLAST WG P		1500	1048.60	1572900	75.43	113145	20431
	㉚	S.W. BALLAST WG S		1500	1052.62	1578930	77.51	116265	20431
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	——
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	——
	㉟	TOTALS [SUM ①-㉞]		163692	580.28	94986172	57.11	9348638	1008065

CONDITION: NO. 10
LIGHT CLEANED BALLAST WITH SLOPS
50% F.O.

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL. (B)]	163692	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	502.	
㊳	L.C.G. AFT F.P.	[LINE ㉟, (D) ÷ (B)]	580.28	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	533.90	FT
㊵	TRIM LEVER	[㊳ − ㊴, −FWD +AFT]	46.38	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	33130	FT-TONS
㊷	TRIM	[㊱ × ㊵ ÷ (12 × ㊶), −FWD +AFT]	19.10	FT
㊸	L.C.F. AFT F.P.	[FROM P. 22]	537.75	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P. 22]	29.00	FT
㊺	TRIM APPLIED FWD	[㊷ × ㊸ ÷ 1143]	8.98	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹ − ㊺]	20.02	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻ + ㊷]	39.12	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻ + ㊼) ÷ 2]	29.57	FT
㊾	IF ㊽ < 65 FT, IS −10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS −10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

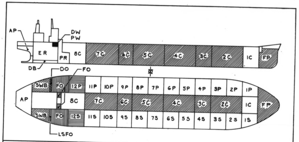
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	154.00	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟, (F) ÷ (B)]	57.11	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿ − (51)]	96.89	FT
(53)	FREE SURF. CORR.	[LINE ㉟, (G) ÷ (B)]	6.16	FT
(54)	AVAILABLE GM	[(52) − (53)]	90.73	FT
(55)	REQUIRED GM	[FROM P. 20]	32.0	FT
(56)	IS (54) ≥ (55)? ☒ YES ☐ NO (SEE NOTE 2)			

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:
CARGO OIL ▤
FUEL OIL ▥
S.W. BALLAST ▨
DIESEL OIL ■
FRESH WATER ■

CARGO OIL	4000	LT
FUEL OIL	9362	LT
S.W. BALLAST	176260	LT
FRESH WATER	623	LT
MISC. DWT.	339	LT
DEADWEIGHT	190584	LT
DISPLACEMENT	249424	LT

LCG AFT FP	541.44	FT
TRIM	2.88	FT
MT 1"	35720	FT-TONS
T P I		
DRAFT, FWD	41.63	FT
MEAN	43.07	FT
AFT	44.51	FT

STABILITY:

KM	117.60	FT
KG	54.87	FT
GM	62.73	FT
FREE SURF. CORR.	4.63	FT
GM AVAILABLE	58.10	FT
GM REQUIRED	18.00	FT

CONDITION: NO. 11
HEAVY CLEANED
BALLAST WITH SLOPS
50 % F.O.

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P. 18)
CARGO OR S.W. BALLAST	①	CTR NO. 1			115.85		49.32		
	②	CTR NO. 2		30601	222.34	6803827	49.30	1508629	124178
	③	CTR NO. 3		15276	330.83	5053759	49.30	753107	62089
	④	CTR NO. 5		30440	581.67	17706035	49.30	1500692	124178
	⑤	CTR NO. 6		15245	689.17	10506397	49.30	751579	62089
	⑥	CTR NO. 7		30498	796.67	24296842	49.30	1503551	124178
	⑦	CTR NO. 8			914.00		53.95		
	⑧	WG NO. 1 P/S			119.55		53.81		
	⑨	WG NO. 2 P/S			188.63		50.70		
	⑩	WG NO. 3 P/S			259.31		49.00		
	⑪	WG NO. 4 P/S			330.86		48.40		
	⑫	WG NO. 5 P/S			402.50		48.35		
	⑬	WG NO. 6 P/S			474.17		48.35		
	⑭	WG NO. 7 P/S			545.83		48.35		
	⑮	WG NO. 8 P/S			617.50		48.35		
	⑯	WG NO. 9 P/S			689.17		48.35		
	⑰	WG NO. 10 P/S			760.80		48.42		
	⑱	WG NO. 11 P/S			832.18		49.32		
	⑲	WG NO. 12 P/S		4000	902.87	3611480	52.62	210480	141668
F.O.	⑳	STORAGE P/S		7734	972.81	7523713	61.20	473321	103124
	㉑	SETTLERS P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR S		641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE S		162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK		16815	49.79	837219	50.23	844617	234179
	㉘	CTR NO. 4		30533	438.33	13383530	49.30	1505277	164078
	㉙	S.W. BALLAST WG P		3640	1048.60	3816904	75.43	274565	——
	㉚	S.W. BALLAST WG S		3212	1052.62	3381015	77.51	248962	——
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	——
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	——
	㉟	TOTALS [SUM ①-㉞]		249424	541.44	135048608	54.87	13685459	1155709

CONDITION: NO. 11
HEAVY CLEANED BALLAST WITH SLOPS
50% F.O.

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL. (B)]	249424	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	516.20	
㊳	L.C.G. AFT F.P.	[LINE ㉟, (D) ÷ (B)]	541.44	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	536.49	FT
㊵	TRIM LEVER	[㊳ − ㊴, −FWD +AFT]	4.95	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	35720	FT-TONS
㊷	TRIM	[㊱ × ㊵ ÷ (12 × ㊶), −FWD +AFT]	2.88	FT
㊸	L.C.F. AFT F.P.	[FROM P. 22]	545.35	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P. 22]	43.00	FT
㊺	TRIM APPLIED FWD	[㊷ × ㊸ ÷ 1143]	1.37	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹ − ㊺]	41.63	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻ + ㊷]	44.51	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻ + ㊼) ÷ 2]	43.07	FT
㊾	IF ㊽ < 65 FT, IS −10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS −10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	117.60	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟, (F) ÷ (B)]	54.87	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿ − (51)]	62.73	FT
(53)	FREE SURF. CORR.	[LINE ㉟, (G) ÷ (B)]	4.63	FT
(54)	AVAILABLE GM	[(52) − (53)]	58.10	FT
(55)	REQUIRED GM	[FROM P. 20]	18.00	FT
(56)	IS (54) ≥ (55)? ☒ YES ☐ NO (SEE NOTE 2)			

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S

APPENDIX

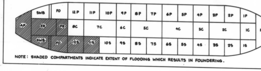
STABILITY AFTER FLOODING DUE TO DAMAGE

1. THE FOLLOWING INFORMATION IS PROVIDED FOR GUIDANCE IN ASSESSING THE VESSEL'S STABILITY AFTER FREE FLOODING OF VARIOUS COMBINATIONS OF COMPARTMENTS AND IS NOT RELATED TO DAMAGE STABILITY REQUIREMENTS OF THE UNITED STATES COAST GUARD.
2. ALL FLOODED COMPARTMENTS ARE ASSUMED TO BE OPEN TO THE SEA THROUGH DAMAGE TO THE HULL, PIPING, ETC., AND FLOODED TO THE LEVEL OF THE WATERPLANE.
3. ALL FLOODED TANKS ARE ASSUMED TO HAVE BEEN INITIALLY EMPTY TO SIMULATE WORST-CASE CONDITIONS.
4. A CONSERVATIVE VALUE FOR THE VESSEL'S VERTICAL CENTER OF GRAVITY (VCG) IS ASSUMED IN ORDER TO SIMULATE WORST-CASE CONDITIONS.

STABILITY AFTER FLOODING DUE TO DAMAGE

FULL LOAD CONDITION
MEAN DRAFT BEFORE FLOODING = 75.0 FT.
TRIM BEFORE FLOODING = 0
VCG (INCLUDING FREE SURFACE EFFECT) ASSUMED 62.63 FEET ABOVE BASELINE

FLOODED COMPARTMENTS	EQUILIBRIUM CONDITION			RANGE OF STABILITY (DEGREES)	HEEL ANGLE FOR MAXIMUM RIGHTING ARM (DEGREES)	MAXIMUM RIGHTING ARM (FEET)
	MEAN DRAFT (FEET)	TRIM +AFT, −FWD (FEET)	HEEL TOWARDS DAMAGE (DEGREES)			
ENGINE ROOM	76.8	10.9	0.	54	18.5	7.6
PRECEDING PLUS PUMP ROOM	77.6	15.0	0.	53	18.0	7.3
ALL PRECEDING PLUS STBD F.O. STORAGE TK.	78.7	20.6	1.6	45	17.0	5.4
ALL PRECEDING PLUS AFT SWB TK & AFT PEAK	79.7	27.1	2.3	39	16.5	4.3
ALL PRECEDING PLUS WING TK 12S	83.3	43.0	7.3	19	15.5	1.1
ALL PRECEDING PLUS WING TK 11S	VESSEL FOUNDERS					



NOTE: SHADED COMPARTMENTS INDICATE EXTENT OF FLOODING WHICH RESULTS IN FOUNDERING.

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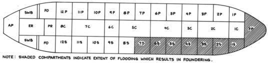
STABILITY AFTER FLOODING DUE TO DAMAGE

BALLAST CONDITION, FLOODING FWD
MEAN DRAFT BEFORE FLOODING = 40.0 FT.
TRIM BEFORE FLOODING = 0
VCG (INCLUDING FREE SURFACE EFFECT) ASSUMED 69.62 FEET ABOVE BASELINE

FLOODED COMPARTMENTS	EQUILIBRIUM CONDITION			RANGE OF STABILITY (DEGREES)	HEEL ANGLE FOR MAXIMUM RIGHTING ARM (DEGREES)	MAXIMUM RIGHTING ARM (FEET)
	MEAN DRAFT (FEET)	TRIM +AFT, -FWD (FEET)	HEEL TOWARDS DAMAGE (DEGREES)			
FOREPEAK	40.9	- 8.5	0.	67	32.0	26.1
PRECEDING PLUS WING TK 1S	41.5	-12.8	1.0	66	32.0	24.4
ALL PRECEDING PLUS WING TK 2S	42.6	-20.3	3.4	61	31.5	20.8
ALL PRECEDING PLUS WING TK 3S	44.2	-30.2	7.1	56	32.0	16.4
ALL PRECEDING PLUS WING TK 4S	46.4	-41.8	11.8	48	32.5	11.8
ALL PRECEDING PLUS WING TK 5S	49.2	-55.0	17.3	37	34.0	7.2
ALL PRECEDING PLUS WING TK 6S	52.9	-70.8	24.0	23	34.5	2.7
ALL PRECEDING PLUS WING TK 7S	VESSEL FOUNDERS					

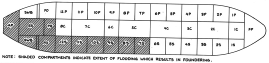


NOTE: SHADED COMPARTMENTS INDICATE EXTENT OF FLOODING WHICH RESULTS IN FOUNDERING.

STABILITY AFTER FLOODING DUE TO DAMAGE

BALLAST CONDITION, FLOODING AFT
MEAN DRAFT BEFORE FLOODING = 40.0 FT.
TRIM BEFORE FLOODING = 15.0 FT. BY STERN
VCG (INCLUDING FREE SURFACE EFFECT) ASSUMED 69.62 FEET ABOVE BASELINE

FLOODED COMPARTMENTS	EQUILIBRIUM CONDITION			RANGE OF STABILITY (DEGREES)	HEEL ANGLE FOR MAXIMUM RIGHTING ARM (DEGREES)	MAXIMUM RIGHTING ARM (FEET)
	MEAN DRAFT (FEET)	TRIM +AFT, -FWD (FEET)	HEEL TOWARDS DAMAGE (DEGREES)			
ENGINE ROOM	41.2	22.6	0.	66	32.0	26.7
PRECEDING PLUS PUMP ROOM	42.1	27.8	0.	67	32.0	27.2
ALL PRECEDING PLUS STBD F.O. STORAGE TK.	42.7	31.1	0.8	65	31.5	25.5
ALL PRECEDING PLUS AFT SWB TK & AFT PEAK	42.8	32.1	0.9	64	31.0	24.6
ALL PRECEDING PLUS WING TK 12S	44.4	39.6	3.3	61	31.5	21.3
ALL PRECEDING PLUS WING TK 11S	46.6	49.5	7.0	56	32.0	17.0
ALL PRECEDING PLUS WING TK 10S	49.2	59.5	11.9	49	32.5	12.5
ALL PRECEDING PLUS WING TK 9S	52.2	68.8	16.4	40	33.5	7.8
ALL PRECEDING PLUS WING TK 8S	56.1	81.0	22.7	26	34.5	3.4
ALL PRECEDING PLUS WING TK 7S	VESSEL FOUNDERS					



NOTE: SHADED COMPARTMENTS INDICATE EXTENT OF FLOODING WHICH RESULTS IN FOUNDERING.

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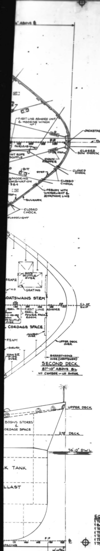


CAPACITIES & CENTERS OF GRAVITY

CARGO OIL		CAPACITY - BBLS		CENTERS OF GRAVITY	
FRAMES	TANK	100% FULL	98% FULL	ABOVE BL	AFT OF FP
105-109	CENTER No. 1	97422	95474	49.32	115.85
97-105	CENTER No. 2	194638	190745	49.30	223.34
93-97	CENTER No. 3	97163	95220	49.30	330.83
77-85	CENTER No. 5	193615	189743	49.30	581.67
73-77	CENTER No. 6	96967	95028	49.30	689.17
65-73	CENTER No. 7	193985	190105	49.30	796.67
59-65	CENTER No. 8	119,583	117,191	53.95	914.00
105-109	WING No. 1 PORT	56358	55231	53.81	119.55
105-109	WING No. 1 STARBOARD	56358	55231	53.81	119.55
101-105	WING No. 2 PORT	81314	79687	50.70	188.63
101-105	WING No. 2 STARBOARD	81314	79687	50.70	188.63
97-101	WING No. 3 PORT	89757	87962	49.00	259.37
97-101	WING No. 3 STARBOARD	89757	87962	49.00	259.37
93-97	WING No. 4 PORT	91193	89369	48.40	330.86
93-97	WING No. 4 STARBOARD	91193	89369	48.40	330.86
89-93	WING No. 5 PORT	91279	89453	48.35	402.50
89-93	WING No. 5 STARBOARD	91279	89453	48.35	402.50
85-89	WING No. 6 PORT	91279	89453	48.35	474.17
85-89	WING No. 6 STARBOARD	91279	89453	48.35	474.17
81-85	WING No. 7 PORT	91267	89442	48.35	545.83
81-85	WING No. 7 STARBOARD	91267	89442	48.35	545.83
77-81	WING No. 8 PORT	91279	89453	48.35	617.50
77-81	WING No. 8 STARBOARD	91279	89453	48.35	617.50
73-77	WING No. 9 PORT	91279	89453	48.35	689.17
73-77	WING No. 9 STARBOARD	91279	89453	48.35	688.17
69-73	WING No. 10 PORT	91153	89330	48.42	760.80
69-73	WING No. 10 STARBOARD	91153	89330	48.42	760.80
65-69	WING No. 11 PORT	88994	87214	49.32	832.18
65-69	WING No. 11 STARBOARD	88994	87214	49.32	832.18
61-65	WING No. 12 PORT	78864	77286	52.62	902.87
61-65	WING No. 12 STARBOARD	78840	77263	52.62	902.87
TOTAL		3,061,381	3,000,147		

SALT WATER BALLAST		CAPACITY		CENTERS OF GRAVITY	
FRAME	TANK		100% FULL S.W. TONS	ABOVE BL	AFT OF FP
109 FWD	FOREPEAK		17,158.99	50.23	49.79
23 AFT	AFTER PEAK		3,274.13	67.28	1,122.09
85-93	CENTER No. 4		31,156.40	49.30	438.33
23-50	S.W. BALLAST PORT		3,638.99	75.43	1,048.60
23-47	S.W. BALLAST STARBOARD		3,211.82	77.51	1,052.62
32-58	DOUBLE BOTTOM		892.06	6.41	1,026.43
TOTAL			59,333.4		

FRESH WATER		CAPACITY		CENTERS OF GRAVITY	
FRAMES	TANK		100% FULL F.W. TONS	ABOVE BL	AFT OF FP
50-57	DISTILLED WATER		460.64	86.29	1,003.75
50-57	POTABLE WATER		162.11	86.29	1,003.75
TOTAL			622.75		

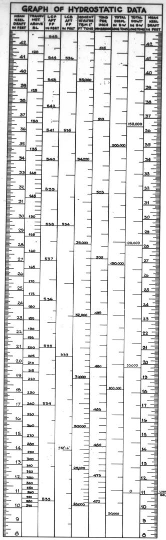
MISCELLANEOUS		CAPACITY - CUBIC FEET		CENTERS OF GRAVITY	
FRAMES	TANK	100% FULL	98% FULL	ABOVE BL	AFT OF FP
23-32	BILGE WATER STORAGE	4633	4540	7.05	1080.32
54-55	SLUDGE	182	179	8.97	1003.41
44-47	SEWAGE HOLDING	1837	1800	46.07	1027.60
TOTAL		6652	6519		

LUBE OIL		CAPACITY - GALLONS		CENTERS OF GRAVITY	
FRAMES	TANK	100% FULL	98% FULL	ABOVE BL	AFT OF FP
41-44	LUBE OIL STORAGE	11,020	10,800	85.41	1036.50
38-41	LUBE OIL SETTLING	10,938	10,719	85.41	1045.50
TOTAL		21,958	21,519		

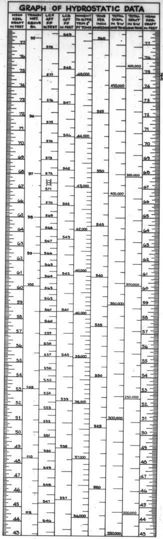
FUEL OIL		CAPACITY - BARRELS		CENTERS OF GRAVITY	
FRAMES	TANK	100% FULL	98% FULL	ABOVE BL	AFT OF FP
47-50	LOW SULFUR FUEL OIL	4340	4253	70.52	1018.44
47-50	DIESEL OIL	1672	1639	87.70	1018.47
50-61	FUEL OIL STORAGE PORT	54490	53400	61.20	972.81
50-61	FUEL OIL STORAGE STARBOARD	54490	53400	61.20	972.81
58-59	FUEL OIL SETTLING PORT	3340	3273	73.66	981.64
58-59	FUEL OIL SETTLING STARBOARD	3340	3273	73.66	981.64
TOTAL		121672	119238		

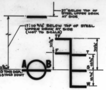
EQUIVALENTS:
1 TON = 2240 LBS
1 BARREL = 42 GALLONS
1 TON SALT WATER = 35 CUBIC FEET = 261.82 GALLONS
1 TON FRESH WATER = 36 CUBIC FEET = 269.30 GALLONS
1 TON FUEL OIL (15API) = 37.23 CUBIC FEET = 278.46 GALLONS = 6.63 BARRELS
1 TON LUBE OIL = 40.00 CUBIC FEET = 299.20 GALLONS = 7.124 BARRELS
1 TON DIESEL OIL = 41 CUBIC FEET = 306.68 GALLONS = 7.302 BARRELS

GRAPH OF HYDROSTATIC DATA



GRAPH OF HYDROSTATIC DATA




27" BELOW TOP OF STEEL UPPER DECK AT SIDE
17'-10 3/4" BELOW TOP OF STEEL UPPER DECK AT SIDE (NOT TO SCALE)
TF
F
T
S
W
A
B
20 5/8"
39 1/8"
18 1/2"
18 1/2"
75'-0 5/16"
456,983 TONS DISPL.
398,143 TONS DDWT

DIMENSIONS & DATA

LENGTH OVERALL	1187'-11 11/16"
LENGTH BETWEEN PERPENDICULARS	1143'-0"
BEAM-MOLDED	228'-0"
DEPTH-MOLDED - UPPER DECK AT SIDE	95'-0"
DEPTH-MOLDED - UPPER DECK AT CENTERLINE	99'-4"
DRAFT - SUMMER FREEBOARD - MOLDED	74'-11 1/4"
DESIGN DRAFT - MOLDED	74'-0"
DISPLACEMENT AT 74'-0" MOLDED DRAFT	450,684 LTSW
DISPLACEMENT AT FREEBOARD DRAFT 75'-0 5/16"	456,983 LTSW
PORT OF REGISTRY	NEW YORK, N.Y.
RADIO CALL LETTERS	WHNH
REGISTERED GROSS TONNAGE	189,416.92
REGISTERED NET TONNAGE	171,126.00
ABS SHAFT HORSEPOWER	45,000
SERVICE SPEED AT 90% ABS SHAFT HORSEPOWER & 74'-0" DESIGN DRAFT-KNOTS	15.9

UST ATLANTIC

OFFICIAL NO. 601437

CAPACITY PLAN

— PREPARED BY —
NEWPORT NEWS SHIPBUILDING
NEWPORT NEWS, VIRGINIA
JANUARY 1979

HULL NO.	DRAWING NO.
613C	0100-759

REVISIONS						
REV.	SHEET	DESCRIPTION	NNS & DD CO. DATE	NNS & DD CO. AUTH'D	OWNER DATE	OWNER APP'D
A		INITIAL ISSUE				
B	1.	PORT OF REGISTRY, REGISTERED GROSS AND NET TONNAGE ADDED IN TABLE OF DIMENSIONS & DATA.				
	2.	LOADLINE MARKINGS ADDED TO SUIT AMERICAN BUREAU OF SHIPPING LETTER OF 9-27-78.				
	3.	LIGHTSHIP, DISPLACEMENT AND DEADWEIGHT TONNAGE ADDED IN GRAPH OF HYDROSTATIC DATA TO SUIT TRIM & STABILITY BOOKLET, DWG NO. 0100-756.				
	4.	ARRANGEMENTS UPDATED THROUGHOUT TO AGREE WITH GENERAL ARRANGEMENT PLANS AND DESIGN DEVELOPMENT.	JDC		1-16-79	LET. NO. 2125V OF 9-27-78

D

AUTHORITY:

GENERAL NOTES:

C

B

613C	309	
NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME

APPROVALS	
OWNERS SHELL LET. NO. 2125V OF 10.25.78	
	USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPT.
FSCM NO. 43689

KEY PLAN

SCALE 1/16" = 1 FT
DRAWN E.H. Robins
CHECKED RCN / JBC
SECT MGR J.W. Halpin
DATE COMPL. 10-5-78
EXAMINED
AUTHORIZED A. Cox
DATE 10-5-78

TECH APPROVAL
CSD APPROVAL

390,000 DWT TANKER
CAPACITY PLAN

USMA DESIGN T11-S-119a
HULL NO. 309

DWG NO.	REV	SHEET NO.
0100-759	B	1 OF 1

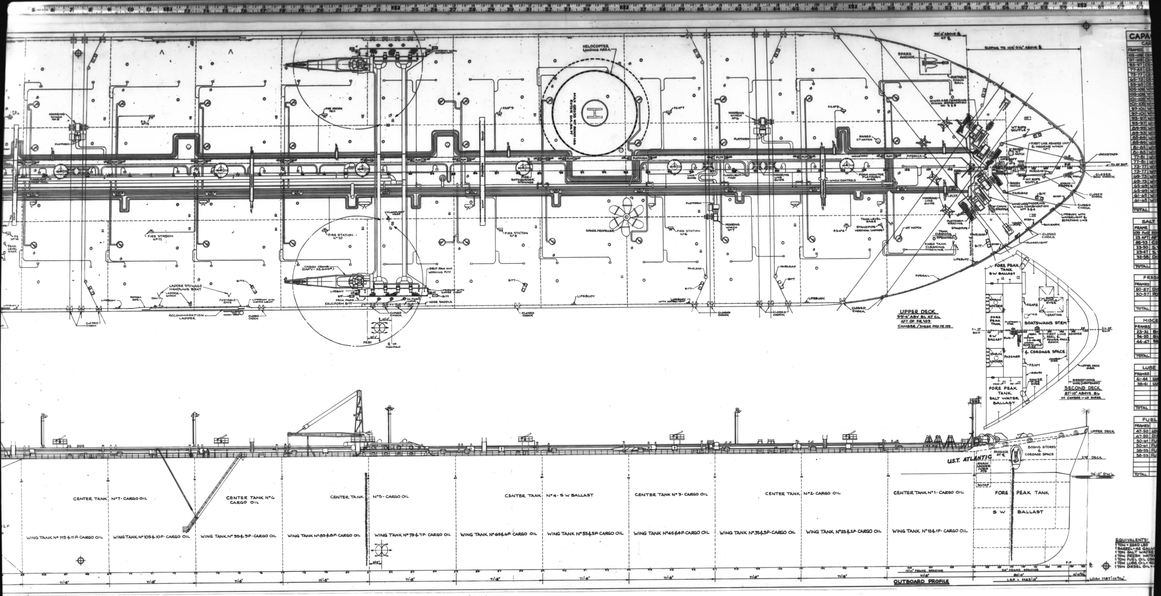
A

REPRODUCTION OFFICE

GROUP:
MC NO.

0100-759

MICRO-MASTER 105 mm
K+E
SEPT. '80
10X
FRAME 1


HELICOPTER LANDING AREA
SPARE ANCHOR
CARGO CRANE (CAPY - 33,000#)
FIRE STATION No 12
FIRE STATION No 10
FIRE STATION No 8
FIRE STATION No 6
SPARE PROPELLER
MOORING WINCH No 6
MOORING WINCH No 7
LADDER STOWAGE HANDLING DAVIT
ACCOMMODATION LADDER
CLOSED CHOCK
LIFEBUOY
FOAM MONITOR PLATFORM OVER
WINCH CONTROLS
WALKWAY
PIPERAILS
JACKSTAFF
CL OF SHIP
UPPER DECK
99'-4" ABV BL AT CL
AFT OF FR 109
CAMBER / SHEER FWD FR 109
FORE PEAK TANK
S W BALLAST
CHAIN LOCKER
BOATSWAINS STRM
CORDAGE SPACE
PASSAGE
FORE PEAK TANK SALT WATER BALLAST
SECOND DECK
87'-10" ABOVE BL
NO CAMBER - NO SHEER
U.S.T. ATLANTIC
UPPER DECK
2nd DECK
74'-0" DWL
BOSN'S STORES & CORDAGE SPACE
SUMP
CENTER TANK No 7 - CARGO OIL
CENTER TANK No 6 CARGO OIL
CENTER TANK No 5 - CARGO OIL
CENTER TANK No 4 - S W BALLAST
CENTER TANK No 3 - CARGO OIL
CENTER TANK No 2 - CARGO OIL
CENTER TANK No 1 - CARGO OIL
FORE PEAK TANK
S W BALLAST
WING TANK No 11S & 11P CARGO OIL
WING TANK No 10S & 10P - CARGO OIL
WING TANK No 9S & 9P - CARGO OIL
WING TANK No 8S & 8P - CARGO OIL
WING TANK No 7S & 7P - CARGO OIL
WING TANK No 6S & 6P CARGO OIL
WING TANK No 5S & 5P CARGO OIL
WING TANK No 4S & 4P CARGO OIL
WING TANK No 3S & 3P - CARGO OIL
WING TANK No 2S & 2P - CARGO OIL
WING TANK No 1S & 1P - CARGO OIL
71'-8"
OUTBOARD PROFILE
LBP = 1143'-0"
CAPA
SALT
FRESH
MISC
LUBE
FUEL
TOTAL
EQUIVALENTS:

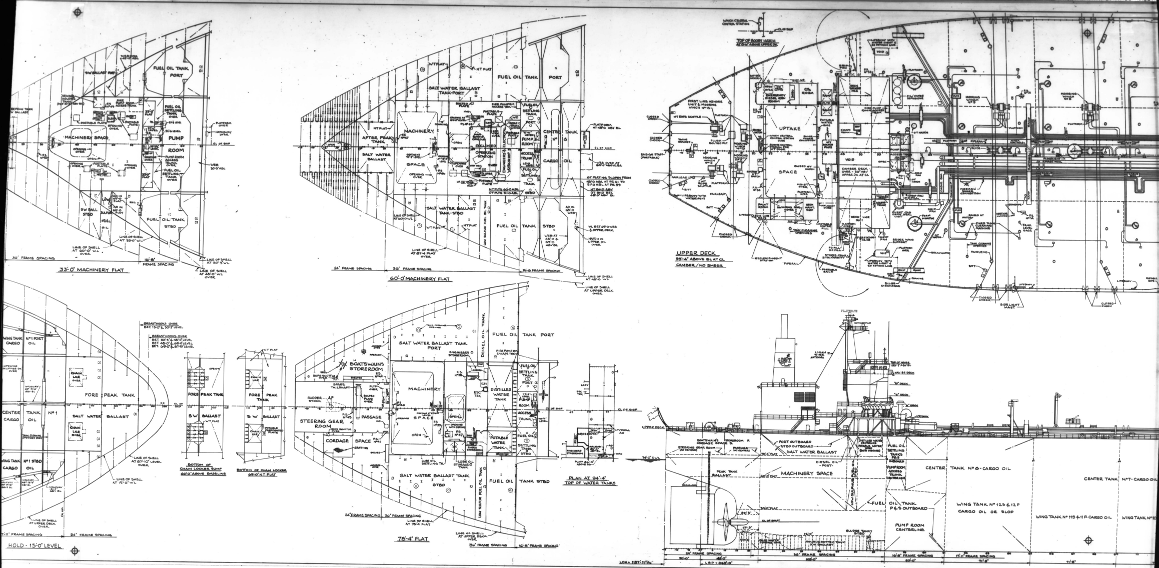
0100-759

MICRO-MASTER 105 mm

SEPT. '80

10X

FRAME 2

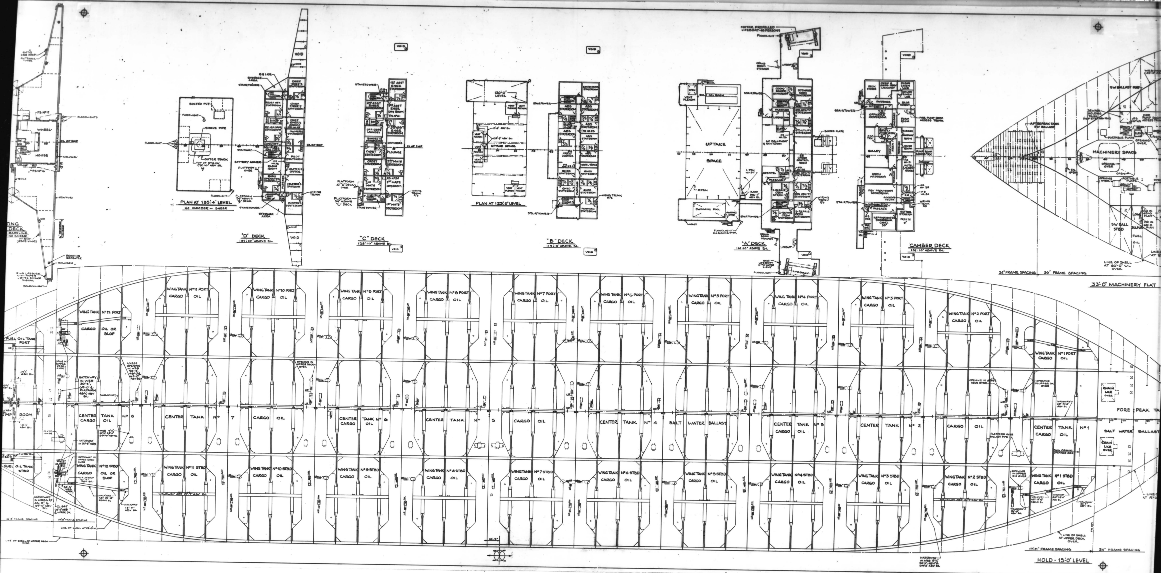

33'-0" MACHINERY FLAT
60'-0" MACHINERY FLAT
UPPER DECK
99'-4" ABOVE BL AT CL
CAMBER / NO SHEER
HOLD - 15'-0" LEVEL
BOTTOM OF CHAIN LOCKER SUMP 66'-0" ABOVE BASELINE
BOTTOM OF CHAIN LOCKER 69'-0" NT FLAT
78'-4" FLAT
PLAN AT 94'-4" TOP OF WATER TANKS
FUEL OIL TANK PORT
FUEL OIL TANK STBD
SALT WATER BALLAST TANK PORT
SALT WATER BALLAST TANK STBD
MACHINERY SPACE
PUMP ROOM
AFTER PEAK TANK
CENTER TANK No 6 CARGO OIL
UPTAKE SPACE
FORE PEAK TANK
STEERING GEAR ROOM
BOATSWAINS STOREROOM
CORDAGE SPACE
DISTILLED WATER TANK
POTABLE WATER TANK
CENTER TANK No 7 - CARGO OIL
WING TANK No 12S & 12P CARGO OIL OR SLOP
PUMP ROOM CENTERLINE
LOA = 1187'-11¾"

0100-759

SEPT. '80

FRAME 3

10X

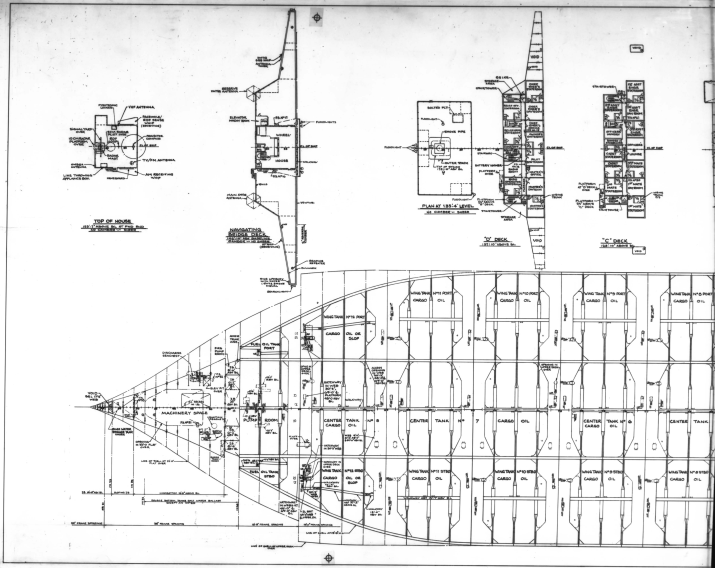

WHEEL HOUSE
PLAN AT 135'-4" LEVEL
NO CAMBER - SHEER
SMOKE PIPE
OUTER STACK
"D" DECK
137'-10" ABOVE BL
"C" DECK
128'-10" ABOVE BL
PLAN AT 123'-0" LEVEL
120'-0" LEVEL
UPTAKE SPACE
"B" DECK
119'-10" ABOVE BL
UPTAKE SPACE
SWIMMING POOL
MOTOR PROPELLED LIFEBOAT-48 PERSONS
"A" DECK
110'-10" ABOVE BL
CAMBER DECK
101'-10" ABOVE BL
GALLEY
CREW MESSROOM
OFFICERS MESSROOM
MACHINERY SPACE
SW BALLAST
24" FRAME SPACING
36" FRAME SPACING
33'-0" MACHINERY FLAT
FUEL OIL TANK PORT
WING TANK Nº12 PORT CARGO OIL OR SLOP
WING TANK Nº11 PORT CARGO OIL
WING TANK Nº10 PORT CARGO OIL
WING TANK Nº9 PORT CARGO OIL
WING TANK Nº8 PORT CARGO OIL
WING TANK Nº7 PORT CARGO OIL
WING TANK Nº6 PORT CARGO OIL
WING TANK Nº5 PORT CARGO OIL
WING TANK Nº4 PORT CARGO OIL
WING TANK Nº3 PORT CARGO OIL
WING TANK Nº2 PORT CARGO OIL
WING TANK Nº1 PORT CARGO OIL
PUMP ROOM
CENTER TANK Nº8 CARGO OIL
CENTER TANK Nº7 CARGO OIL
CENTER TANK Nº6 CARGO OIL
CENTER TANK Nº5 CARGO OIL
CENTER TANK Nº4 SALT WATER BALLAST
CENTER TANK Nº3 CARGO OIL
CENTER TANK Nº2 CARGO OIL
CENTER TANK Nº1 SALT WATER BALLAST
FORE PEAK TA
CHAIN LKR OVER
FUEL OIL TANK STBD
WING TANK Nº12 STBD CARGO OIL OR SLOP
WING TANK Nº11 STBD CARGO OIL
WING TANK Nº10 STBD CARGO OIL
WING TANK Nº9 STBD CARGO OIL
WING TANK Nº8 STBD CARGO OIL
WING TANK Nº7 STBD CARGO OIL
WING TANK Nº6 STBD CARGO OIL
WING TANK Nº5 STBD CARGO OIL
WING TANK Nº4 STBD CARGO OIL
WING TANK Nº3 STBD CARGO OIL
WING TANK Nº2 STBD CARGO OIL
WING TANK Nº1 STBD CARGO OIL
17'-11" FRAME SPACING
24" FRAME SPACING
HOLD - 15'-0" LEVEL

0100-759

SEPT. '80

FRAME 4

10X

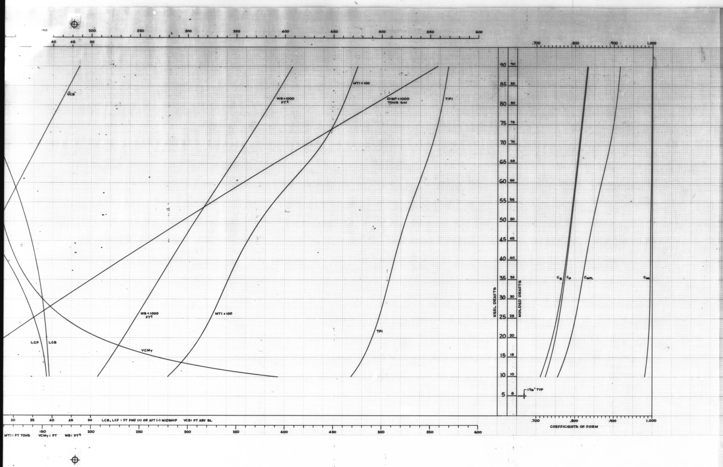

PYROTECHNIC LOCKER
VHF ANTENNA
FACSIMILE/ RDF SENSE WHIP (RECEIVING)
SIGNAL YARD OVER
3CM RADAR PLATF OVER
10 CM RADAR PLATFORM OVER
RDF LOOP
PROJECTOR COMPASS
CL OF SHIP
RADAR MAST
TV/FM ANTENNA
OMEGA ANTENNA
LINE THROWING APPLIANCE BOX
NAMEBOARD
AM RECEIVING WHIP
TOP OF HOUSE
155'-7" ABOVE BL AT FWD END
NO CAMBER ~ SHEER
XMTG SSB WHIP
ANTENNA TUNER
RESERVE XMTG ANTENNA
ELEVATOR MACHY ROOM
F.S. Nº17
FLOODLIGHTS
WHEEL-
HOUSE
CL OF SHIP
WALKWAY
F.S. Nº16
RAILS
MAIN XMTG ANTENNA
VENTURI
NAVIGATING BRIDGE DECK
146'-10" ABV BASELINE
CAMBER ~ NO SHEER
HF WHIP (RECEIVING)
6" REVERSE CAMBER
BEARING REPEATER
BULWARK
RING LIFEBUOY WITH WATER LIGHT & SMOKE SIGNAL
SEARCHLIGHT
BOLTED PLT
FLOODLIGHT
SMOKE PIPE
FLOODLIGHT
OUTER STACK
TOP OF STACK 175'-10" ABV BL
FLOODLIGHT
PLAN AT 135'-4" LEVEL
NO CAMBER ~ SHEER
VOID
CG LKR
STORAGE AREA
STAIRTOWER
CHIEF ENGR'S STATEROOM
RELIEF OFF. STATEROOM
CHIEF ENGR'S DAYROOM
CHIEF ENGR'S OFFICE
RELIEF OFFR STATEROOM
OWNER'S STATEROOM
CONT. OFF.
EQUIP. RM
CL OF SHIP
STAIRWAY
PILOT STATEROOM
BATTERY LOCKER
RADIO ROOM
PLATFORM OVER
MASTER'S OFFICE
RADIO OPERATOR STATEROOM
PASSAGE
MASTER'S DAYROOM
WIRING TRUNK
PLATFORM 54" ABOVE "D" DECK
MASTER'S STATEROOM
STAIRTOWER
STORAGE AREA
VOID
"D" DECK
137'-10" ABOVE BL
VOID
STAIRTOWER
1ST ASST ENGR STATEROOM
2ND ASST ENGR STATEROOM
1ST ASST ENGR DAY ROOM
F.S. Nº21
OFFICERS LAUNDRY
3RD ASST ENGR STATEROOM
BONDED STORES LKR
OFFICERS
LOUNGE
CL OF SHIP
CADET STATEROOM
CADET STATEROOM
3RD MATE STATEROOM
PLATFORM AT "D" DECK OVER
2ND MATE STATEROOM
F.S. Nº20
1ST MATE DAYROOM
WIRING TRUNK
PLATFORM 54" ABOVE "C" DECK
STAIR TOWER
1ST MATE STATEROOM
"C" DECK
128'-10" ABOVE BL
VOID
VOID BEL 17'-5" WEB
DISCHARGE SEACHEST
FIRE PUMP ROOM
ACCESS TRUNK OVER
F.S. Nº32
ELEV PIT OVER
42" RECESS IN I.B.
MACHINERY SPACE
F.S. Nº31
SUCTION SEACHEST
BILGE WATER STORAGE TANK UNDER
OPENING IN 35'-0 FLAT OVER
SLUDGE TANK UNDER
LINE OF SHELL AT 35'-0" FLAT OVER
FUEL OIL TANK PORT
FUEL OIL TANK STBD
PUMP ROOM
WING TANK Nº12 PORT
CARGO OIL OR SLOP
OPNG IN UPPER DECK OVER
HATCHWAY IN WEB 30'-5", 69'-0" & PLATFORM 48'-0 ABV BL
WALKWAY
ACCESS OPENING IN WEB 30'-5", 48'-0" & 69'-0" ABV BL
CENTER CARGO TANK OIL Nº 8
PLATF OVER
WEB 15'-0", 30'-5", 48'-0" & 69'-0" ABV BL
HATCHWAY IN 30'-5" WEB
HATCHWAY IN UPPER DECK OVER
WING TANK Nº12 STBD
CARGO OIL OR SLOP
WALKWAY 15'-0" ABV BL
30'-5" WEB OVER
WALKWAY ABT 27'-2" ABOVE BL
WALKWAY 15'-0" ABV BL
HATCHWAY IN WEBS AT 48'-0" & 69'-0" ABV BL
IL BST 69'-0" WEB & UPPER DK
WING TANK Nº11 PORT CARGO OIL
WING TANK Nº10 PORT CARGO OIL
WING TANK Nº9 PORT CARGO OIL
WING TANK Nº8 PORT CARGO OIL
CENTER TANK Nº 7 CARGO OIL
OPENING IN UPPER DECK OVER
CENTER CARGO TANK Nº 6 OIL
CENTER TANK
WING TANK Nº11 STBD CARGO OIL
WALKWAY ABT 15'-7" ABV BL
WING TANK Nº10 STBD CARGO OIL
WING TANK Nº9 STBD CARGO OIL
WING TANK Nº8 STBD CARGO OIL
IB 14'-0" ABV BL
SLOPING IB
INNERBOTTOM 15'-0" ABOVE BL
DOUBLE BOTTOM TANKS SALT WATER BALLAST EXCEPT AS NOTED
FR 21
FR 23
FR 28
FR 33
FR 38
24" FRAME SPACING
36" FRAME SPACING
16'-8" FRAME SPACING
17'-11" FRAME SPACING
LINE OF SHELL AT 15'-0" W.L.
LINE OF SHELL AT UPPER DECK OVER

0100-759

SEPT. '80

10X

FRAME 5



REVISIONS						
REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHO	OWNER DATE	OWNER APPD
A		INITIAL ISSUE	3-21-77			
B		CORRECTED LENGTH OVERALL AND DRAFT, KEEL SUMMER FREEBOARD	9/27/78			

ABBREVIATIONS USED

VCM_L	VERTICAL CENTER OF LONGITUDINAL METACENTER FT ABV BL
VCM_T	VERTICAL CENTER OF TRANSVERSE METACENTER FT ABV BL
LCF	LONGITUDINAL CENTER OF FLOTATION FT FWD OR AFT MS
LCB	LONGITUDINAL CENTER OF BUOYANCY FT FWD MS
VCB	VERTICAL CENTER OF OF BUOYANCY FT ABV BL
DISPL	HULL DISPLACEMENT INCLUDING APPENDAGES TONS SW
MT1	MOMENT TO TRIM ONE INCH FT TONS
TPI	TONS PER INCH IMMERSION
WS	WETTED SURFACE INCLUDING RUDDER, RUDDER HORN AND SHOE FT²
C1DOFTS	CHANGE IN DISPLACEMENT FOR ONE FOOT TRIM BY STERN TONS
C_B	BLOCK COEFFICIENT $V \div (LBP \times B \times DR)$
C_P	PRISMATIC COEFFICIENT $V \div (LBP \times A_{MS})$
C_{WPL}	WATER PLANE COEFFICIENT $A_{WPL} \div (LBP \times B)$
C_{MS}	MIDSHIP COEFFICIENT $A_{MS} \div (B \times DR)$

NOTES

1. ALL HYDROSTATIC DATA DEVELOPED FROM MOLD LOFT OFFSETS.
2. BOTTOM OF KEEL AND KEEL DRAFT MARKS ARE 1 1/16" BELOW MOLDED BASELINE AND MOLDED MARKS.
3. VALUES OF COEFFICIENTS OF FORM ARE OF MOLDED HULL USING LENGTH BETWEEN PERPENDICULARS.
4. ALL CURVES EXCEPT COEFFICIENTS ARE BASED ON A HULL LENGTH FROM STEM TO TRANSOM.
5. APPENDAGES ARE INCLUDED IN VALUES OF DISPLACEMENT AND WETTED SURFACE. ALL OTHER CURVES REPRESENT MOLDED HULL CHARACTERISTICS.

PRINCIPAL DIMENSIONS

LENGTH, OVER ALL	1187'-11 11/16"
LENGTH, BETWEEN PERPENDICULARS	1145'-0"
BEAM, MOLDED	228'-0"
DEPTH, MOLDED UPPER DECK AT SIDE	95'-0"
DRAFT, MOLDED TO DESIGNED WATERLINE	74'-0"
DRAFT, KEEL TO DESIGNED WATERLINE	74'-1 1/16"
DRAFT, KEEL SUMMER FREEBOARD	75'-0 5/16"

PRINCIPAL CHARACTERISTICS
AT KEEL DRAFT OF 74'-1 1/16"

DISPLACEMENT TONS SW	480984.
MOMENT TO TRIM ONE INCH FT TONS	44962.
TONS PER INCH IMMERSION	557.7
LONGITUDINAL CENTER OF BUOYANCY FT FWD MS	24.0
LONGITUDINAL CENTER OF FLOTATION FT AFT MS	5.7
VERTICAL CENTER OF BUOYANCY FT ABV BL	38.4
VERTICAL CENTER OF TRANSVERSE METACENTER	95.6
VERTICAL CENTER OF LONGITUDINAL METACENTER	1410.2
WETTED SURFACE	369808.
APPENDAGE DISPLACEMENT	1130.
CHANGE IN DISPLACEMENT ONE FOOT TRIM BY STERN	55.
BLOCK COEFFICIENT	.816
PRISMATIC COEFFICIENT	.818
WATER PLANE COEFFICIENT	.899
MIDSHIP SECTION COEFFICIENT	.997

NO.	REFERENCES	DWG NO.

NNS & DD CO HULL NO.	MARAD HULL NO.
G15	311
G14	310
G13	309

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPT
FSCM NO. 43689

KEY PLAN

SCALE AS SHOWN = 1 FT
DRAWN J.D. BENTON, JR.
CHECKED C.J. Gotthelf
SECT MGR A. Conley
DATE COMPL. 3-21-77
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 3-21-77
TECH APPROVAL
CSD APPROVAL EED for R.L. HARRINGTON

390,000 DWT TANKER
HYDROSTATIC CURVES

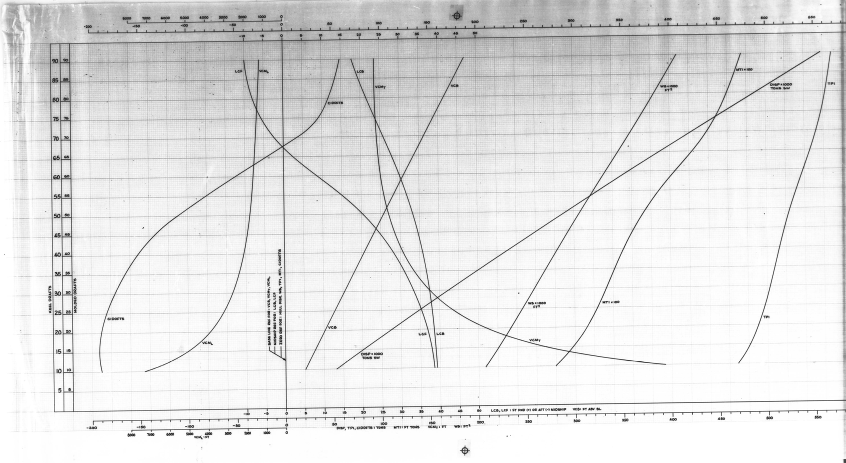
U S M A DESIGN T11-S-119a
U S M A DWG NO.
HULL NO.
DWG NO. 0100-761
REV B
SHEET NO. OF

C
B
A

0100-761

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
Charge to 61BC-10079
DATE 3/21/77 SIGNED A. Conley
DEPT.
YARD PRINTS
ORDERED BY DESIGN
SPECIAL PRINTS
GROUP:
MC NO.

0100-761
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 1
10X



0100-761

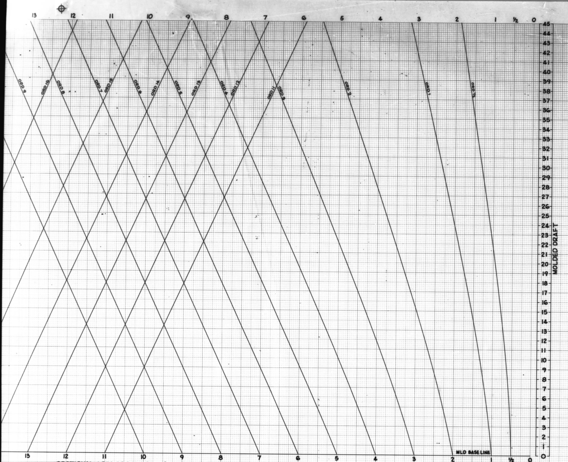
MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 2



SECTIONAL AREA OF ONE SIDE 1" = 500 SQ. FT. (MLD)
STATIONS FOR BONJEAN CURVES SPACED 57.15 FT.

REVISIONS						
REV	ZONE	DESCRIPTION	N N S & D D CO. DATE	N N S & D D CO. AUTHO	OWNER DATE	OWNER APPD
A		INITIAL ISSUE				

AUTHORITY:

GENERAL NOTES:

1. ALL CALCULATIONS HAVE BEEN MADE FROM RETURNED MOLD LOFT OFFSETS.

PRINCIPAL DIMENSIONS:

LENGTH FOR ORDINATES .... 1145'-0"
LENGTH BETWEEN PERPENDICULARS .... 1145'-0"
BEAM MOLDED .... 228'-0"
DEPTH MOLDED TO UPPER DK AT SIDE .... 95'-0"
DRAFT MOLDED TO DESIGN WATERLINE .... 74'-0"

C

NNS & DD CO HULL NO.	MARAD HULL NO.	
615	311	
614	310	
613	309	

APPROVALS	
OWNERS	ABS
	USCG

B

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING DEPARTMENT

KEY PLAN

SCALE AS SHOWN = 1 FT
DRAWN J. D. BENTON, JR.
CHECKED Gelfenbaum
SECT MGR J.W. Hofgan 4/2/77
DATE COMPL. 4-2-77
EXAMINED
AUTHORIZED A. Con-Ray
DATE 4-11-77
TECH APPROVAL
CSD APPROVAL R. L. Harrington

A

BONJEAN CURVES

USMA DESIGN T11-5-1162
~~USMA DWG NO.~~
HULL NO. 309, 310, 311

NO.	REFERENCES	DWG NO.

DWG NO. 0100-762
REV A
SHEET NO. 1 OF 1

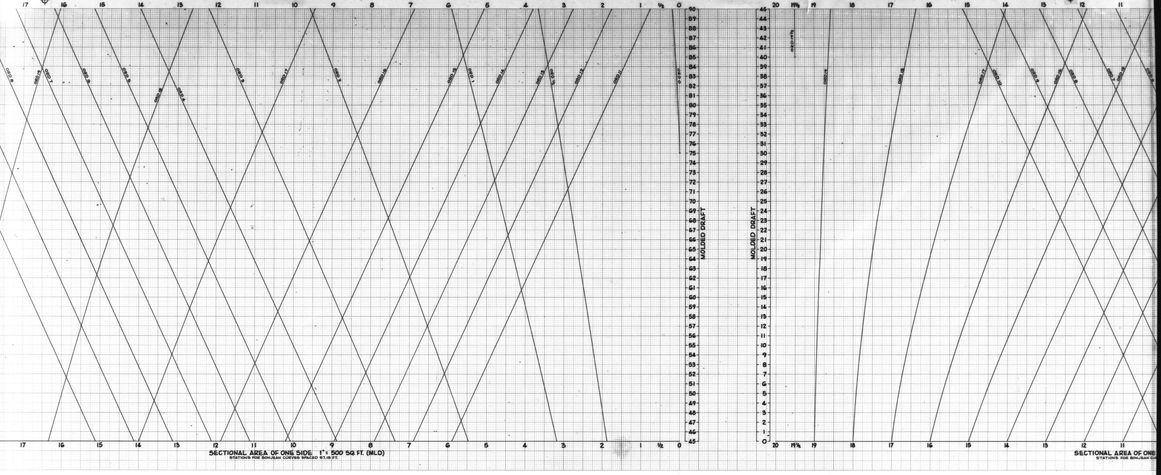
1

REPRODUCTION OFFICE
YARD PRINTS NO
GROUPING NO
REMARKS
Charge to 613-10079
DATE 4-11-77
SIGNED J.W. Hofgan

FIRST ISSUE	DEPT.	NO. PRTS.	REV.	DATE ISSUED	SPECIAL PRINTS

YARD PRINTS
ORDERED BY DESIGN
GROUP:
MC NO.

0100.762
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
10X
FRAME 1

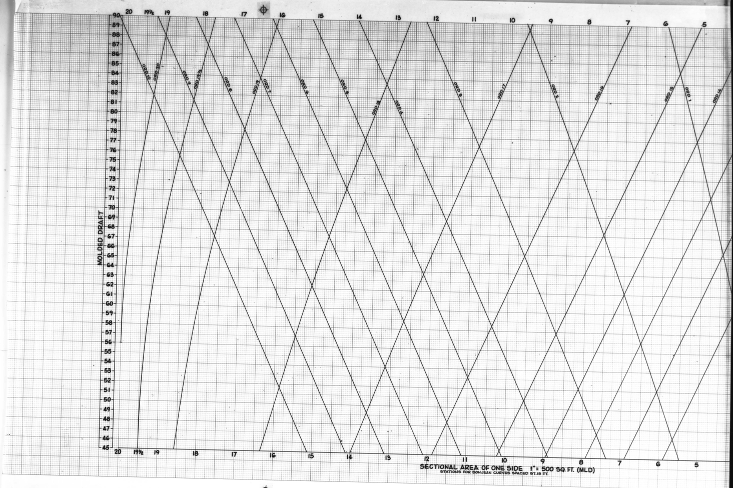


0100.762

SEPT. '80

10X

FRAME 2



0100.762

MICRO-MASTER® 105 mm

K+E

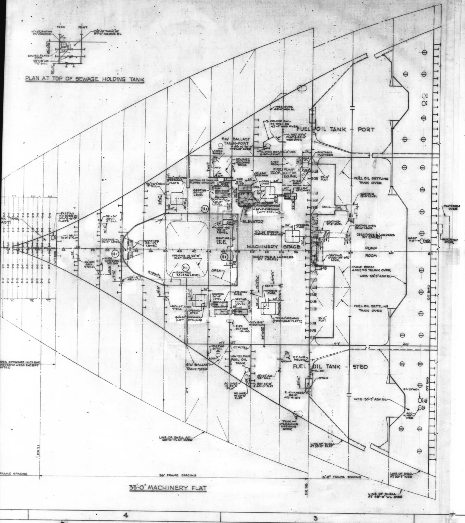
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

® Registered trade mark of KEUFFEL & ESSER CO.

SEPT. '80

10X

FRAME 3



PLAN AT TOP OF SEWAGE HOLDING TANK
FUEL OIL TANK - PORT
SW BALLAST TANK-PORT
SEWAGE HOLDING TANK
FIRE PUMP ROOM ACCESS TRUNK
FUEL OIL SETTLING TANK OVER
ELEVATOR
MACHINERY SPACE
PUMP ROOM
PUMP ROOM ACCESS TRUNK OVER
FUEL OIL SETTLING TANK OVER
SW BALLAST TANK-STBD
FUEL OIL TANK - STBD
LINE OF SHELL AT 60'-0" FLAT OVER
LINE OF SHELL AT 33'-0" FLAT
LINE OF SHELL AT 48'-0" WL OVER
30" FRAME SPACING
19'-6" FRAME SPACING
33'-0" MACHINERY FLAT

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH'D	OWNER DATE	OWNER APP'D
H	40B 46' 68' 78'	1- 33'-0" MACHY FLAT; GRATING 33'-3" LEVEL ADDED FRS 47-48 P/S IN WAY OF OPENING IN DECK. INDICATION OF GRATING OVER AT FRS 45-47 BETWEEN ABOUT 10'-0" & 20'-0" OFF CL PORT REVISED AND INCLINED LADDER IN WAY OF GRATING RELOCATED INBD. GRATING ADDED FRS 36-40 P/S IN WAY OF DECK OPENING. GRATING FRS 32-34 CL REVISED & RELOCATED FROM 33'-4" TO 33'-9" LEVEL. 60'-0" MACHY FLAT; GRATING FRS 43½-44½ STBD IN WAY OF UP-IL RELOCATED FROM 69'-0" TO 70'-0" LEVEL. GRATING OVER FRS 32-35 CL RELOCATED FROM 70'-3" TO 71'-3" LEVEL. ALL TO IMPROVE ACCESS IN MACHY ROOM & AS SHOWN ON DWG NO. 6630-234 & 6650-236.	18C		4-1-79	

REVISIONS CONTINUED AT LEFT

AUTHORITY:

GENERAL NOTES:

1. SILL HEIGHT OF ALL CLOSURES ARE TAKEN AT CL OF CLOSURE & ABOVE STEEL DECK.
2. THIS DRAWING IS SUPERSEDED & REPLACED BY DRAWING NO. 0100-931 FOR G15C.

NNS & DD CO HULL NO.	MARAD HULL NO.
G14C	310
G13C	309

APPROVALS

OWNERS SHELL LETTER OF 3-26-75

USPH LETTER OF 8-25-75

USCG LETTER 9940/NNS&DD HULLS G13-G15 OF 4-30-75

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPT
FSCM NO. 43689

KEY PLAN

SCALE 1/8" = 1 FT
DRAWN S. PARKMAN
CHECKED J.D. DENTON, JR.-C.
SECT MGR A. Conway
DATE COMPL. 2/17/75
EXAMINED C.M. Kelly
AUTHORIZED
DATE 3-26-75
TECH APPROVAL
CSD APPROVAL

NO.	REFERENCES	DWG NO.
8	NAV. BRIDGE & HOUSE TOP GENERAL ARRGT	0100-778
7	ACCOMMODATIONS GEN'L ARRGT, DECKHOUSE	0100-774
6	UPPER DK AFT OF FR 81 GENERAL ARRGT	0100-909
5	UPPER DK FWD OF FR 81 GENERAL ARRGT	0100-908
4	SECOND DK FWD & 78'-6" FLAT AFT GENERAL ARRGT	0100-917
3	33'-0" & 60'-0" FLAT AFT GENERAL ARRGT	0100-770
2	HOLD AFT OF FR 81 GENERAL ARRGT	0100-920
1	HOLD FWD OF FR 81 GENERAL ARRGT	0100-919

390,000 DWT TANKER
33'-0" & 60'-0" FLAT AFT
GENERAL ARRANGEMENT

USMA DESIGN T11-S-116a
HULL NO. 309 & 310
DWG NO. 0100-770 (SEE NOTE NO. 2)
REV H
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS BLUELINE PRINTS FROM AN AUTO-POSITIVE ~ CHARGE TO G14C-10079 ~
DATE 5-12-79

GROUP: MC NO.

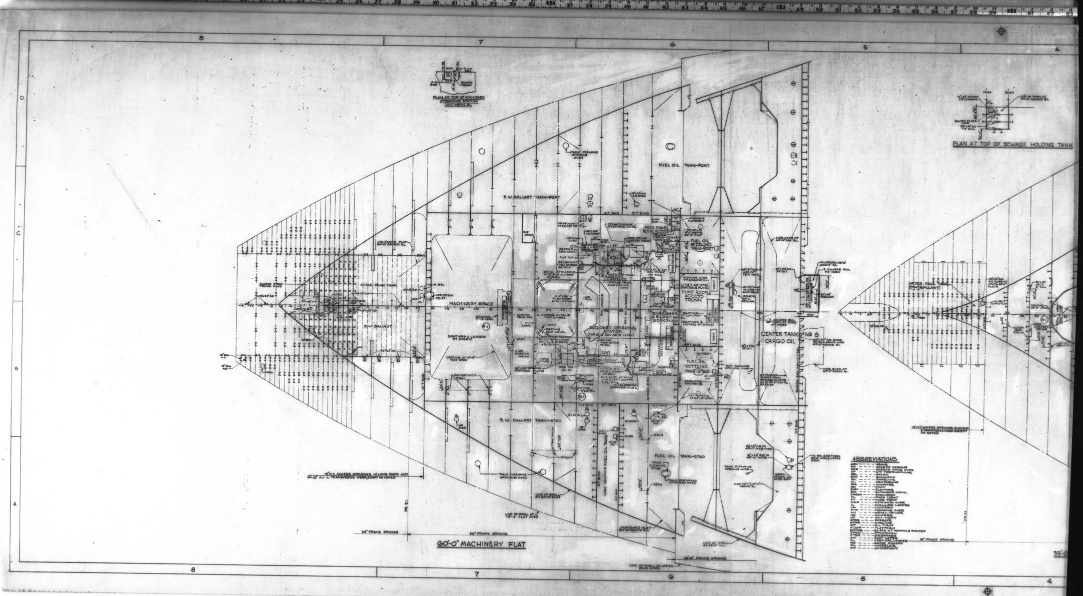
0100-770

MICRO-MASTER 105 mm K+E

SEPT. '80

10X

FRAME 1


PLAN AT TOP OF ENCLOSED OPERATING STATION 72'-0" ABOVE BL
PLAN AT TOP OF SEWAGE HOLDING TANK
FUEL OIL TANK-PORT
S.W. BALLAST TANK-PORT
TANK CLEANING OPENING OVER
AFTER PEAK TANK
MACHINERY SPACE
S.W. BALLAST
FIRE PUMP ROOM ACCESS TRUNK
FUEL OIL SETTLING TANK-PORT
PUMP ROOM ACCESS TRUNK
ENGINEERS & ELECT. WORKSHOP
ENCLOSED OPERATING STATION
CENTER TANK Nº 8 CARGO OIL
FUEL OIL SETTLING TANK-STBD
S.W. BALLAST TANK-STBD
LOW SULPHUR FUEL OIL TANK
FUEL OIL TANK-STBD
AFTER PEAK TANK (S.W. BALLAST)
LIGHTENED FLAT
LINE OF SHELL
18"DIA ACCESS OPENINGS IN LONG. BHDS AND 15"x23" AO IN TRANSVERSE WEBS EXCEPT AS NOTED
15"x23" ACCESS OPENINGS IN CL BHD & TRANSVERSE WEBS EXCEPT AS NOTED
24" FRAME SPACING
32" FRAME SPACING
19'-8" FRAME SPACING
LINE OF SHELL AT UPPER DECK OVER
60'-0" MACHINERY FLAT
ABBREVIATIONS
ABV ---- ABOVE
AO ---- ACCESS OPENING
AOO ---- ACCESS OPNG OVER
AP ---- AFT PERPENDICULAR
BEL ---- BELOW
BHD ---- BULKHEAD
BL ---- BASELINE
CL ---- CENTERLINE
DIA ---- DIAMETER
DN ---- DOWN
ELEV ---- ELEVATOR
EM ---- EXPANDED METAL
ENGRS ---- ENGINEERS
FL ---- FIXED LIGHT
FT ---- FUME TIGHT
HWO ---- HATCHWAY OVER
IL ---- INCLINED LADDER
LAV ---- LAVATORY
MHO ---- MANHOLE OVER
MJ ---- METAL JOINER
NO. ---- NUMBER
NT ---- NON-TIGHT
OPER ---- OPERATE
OPNG ---- OPENING
OT ---- OIL TIGHT
PLATF ---- PLATFORM
RWTMB ---- RAISED WT MANHOLE BOLTED
STAN ---- STANCHION
STBD ---- STARBOARD
SW ---- SALT WATER
VL ---- VERTICAL LADDER
WC ---- WATER CLOSET
WL ---- WATERLINE
WT ---- WATERTIGHT
FR 21
8
7
6
5
4
D
C
B
A

0100-770

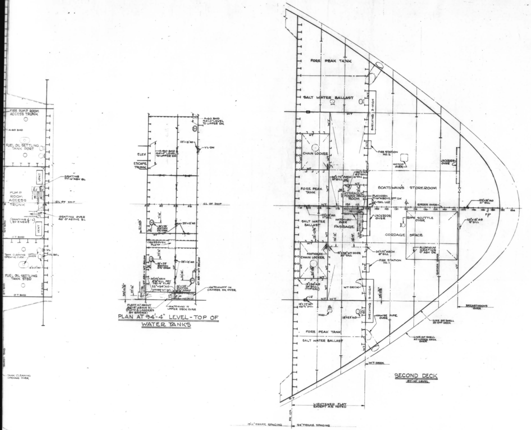
MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 2



ABBREVIATIONS

ABV - - - - ABOVE
AO - - - - ACCESS OPENING
AP - - - - AFTER PERPENDICULAR
BEL - - - - BELOW
BHD - - - - BULKHEAD
CL - - - - CENTER LINE
COAM - - - - COAMING
DN - - - - DOWN
ELEV - - - - ELEVATOR
EM - - - - EXPANDED METAL
ENGRS - - - - ENGINEERS
FP - - - - FORWARD PERPENDICULAR
FR - - - - FRAME
FT - - - - FUME-TIGHT
IL - - - - INCLINED LADDER
LR - - - - LADDER RUNGS
MHO - - - - MANHOLE OVER
MJ - - - - METAL JOINER
NT - - - - NON-TIGHT
OT - - - - OILTIGHT
PLATF - - - - PLATFORM
RWTMB - - - RAISED WATERTIGHT MANHOLE BOLTED
RWTMH - - - RAISED WATERTIGHT MANHOLE HINGED
STAN - - - - STANCHION
STBD - - - - STARBOARD
VL - - - - VERTICAL LADDER
WT - - - - WATERTIGHT
FS - - - - FIRE SCREEN

REVISIONS

REV	ZONE	DESCRIPTION		NNS & DD CO DATE	NNS & DD CO AUTH'D	OWNER DATE	OWNER APP'D
C (CONT)	6-C'	5. INBD BHD OF FIRE PUMP ROOM ACCESS TRUNK FRS 57-58 PORT RELOCATED FROM 52" TO 72" INBD OF LONG. BHD 39'-0 1/8" OFF CL PORT TO IMPROVE ACCESS.					
	6-B'	6. LUBE OIL STORAGE TANK FRS 38-41 STBD REDESIGNATED LUBE OIL SETTLING TANK & LUBE OIL SETTLING TANK FRS 41-44 STBD REDESIGNATED LUBE OIL STORAGE TANK TO SUIT DESIGN DEVELOPMENT OF MACHINERY SPACE ARRANGEMENT.					
	6-C'	7. ENGINEER'S STOREROOM ADDED FR 44-50 BET 24'-0" AND 39'-0 1/8" OFF CL PORT TO SUIT DESIGN DEVELOPMENT OF MACHINERY SPACE ARRANGEMENT AS INDICATED ON DWG NO. 257324.					
	6-A', 6-B', 6-C', 6-D', 7-A', 7-C'	8. INDICATION OF TANK CLEANING OPENING OVER ADDED FRS 58-59 IN WAY OF FUEL OIL SETTLING TANKS P/S, FRS 56-57 P/S IN WAY OF FUEL OIL TANKS, FRS 42-43 PORT, FRS 39-40 STBD & FRS 30-31 P/S IN WAY OF SW BALLAST TANK AS DISCUSSED WITH OWNERS & AUTHORIZED BY COST ENGINEER'S LETTER OF 6-15-76. LIGHTENING OPENING FRS 58-59 P/S IN WAY OF FUEL OIL SETTLING TANK REVISED TO SUIT.					
	5-C', 6-C', 7-B', 7-C'	9. FWD BHD OF ELEVATOR & ESCAPE TRUNK FR 50 PORT BETWEEN 94'-4" ABOVE BL & UPPER DECK OVER AND AFT BHD OF FIRE PUMP ROOM ACCESS TRUNK FR 57 BET. 33'-0" & 36'-0" OFF CL PORT FROM 94'-4" ABOVE BL TO UPPER DK OVER NOTED TO BE A-60 CLASS BHD. AFT & INBD BHD OF FIRE PUMP ROOM ACCESS TRUNK FRS 57-58 PORT; INBD, OUTBD & AFT BHD OF ELEVATOR & ESCAPE TRUNK FRS 48-50 PORT; TRANSV BHD FR 23 INBD OF 39'-0 1/8" OFF CL P/S NOTED TO BE A-60 CLASS BHD. METAL JOINER FIRE SCREEN DOOR ADDED IN TRANSV BHD FR 23 AT 54" OFF CL STBD. ALL TO SUIT US COAST GUARD REQUIREMENTS FOR FIRE PROTECTION.					
	7-C'	10. INDICATION OF MHO FRS 25-26 PORT IN WAY OF SW BALLAST TANK RELOCATED FROM ABOUT 30" TO ABT 52" FWD OF FR 23 TO AGREE WITH REF NO. 6. VL IN WAY OF SAME RELOCATED FWD TO SUIT.					
	7-B', 7-C'	11. SPARE TAILSHAFT SHOWN STOWED FR 10-12 PORT AND INDICATION OF BOLTED PLATE OVER ADDED IN WAY OF SAME AS DISCUSSED WITH OWNER'S REPRESENTATIVE ON 4-12-76. MJ DOOR IN TRANSV BHD FR 9 RELOCATED FROM 36" OFF CL PORT TO 12'-6" OFF CL STBD AND MANHOLE FRS 9-10 RELOCATED FROM 54" TO 19'-6" OFF CL STBD TO SUIT.					
	6-B' & 6-C', 7-B', 7-C'	12. ACCESS OPENING IN 78'-4" FLAT FRS 27-28 & FRS 48-49 RELOCATED FROM ABOUT 43'-6" TO 46'-6" OFF CL P/S TO IMPROVE ACCESS. VL BELOW IN WAY OF SAME RELOCATED TO SUIT.					
	7-B', 7-C'	13. ARCH IN TRANSV BHD FR 38 RELOCATED FROM 22'-6" TO 22'-0" OFF CL P/S & 30"x69"x9" SILL ARCH ADDED IN TRANSV BHD FR 38 AT 10'-6" OFF CL P/S TO SUIT DEVELOPMENT OF MACHY ROOM ARRANGEMENT.					
	6-B', 6-C'	14. ARCH IN TRANSV BHD FR 44 RELOCATED FROM 22'-6" TO 21'-0" OFF CL P/S & ALTERED FROM 30"x69"x9" SILL TO 60"x69"x18" SILL TO ACCOMMODATE SHIPPING MACHINERY IN MACHY SPACE.					
	6-B'	15. OPENING IN 78'-4" FLAT FRS 38-40 AT 21'-0" OFF CL STBD ALTERED FROM 60"x60" TO 60"x72" TO FACILITATE SHIPPING OF MACHINERY IN MACHY SPACE AS REQUESTED BY OUR MACHY ENGRS.					
	6-B' & 6-C', 7-B' & 7-C'	16. FIRE STATIONS ADDED IN MACHINERY SPACE TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 2400-1020.	EP C.	1/4/77	KC	LET.	OF 1-19-77
D	4A'	1. STIFFENERS ON TRANSV BHD FR 124 RELOCATED FROM FWD TO AFT SIDE OF BHD TO SUIT STRUCTURAL DEVELOPMENT AS SHOWN ON DWG NO. 1040-620.					
	6B'	2. HATCHWAY FRS 44-47 STBD RELOCATED FROM 25'-6" TO 28'-0" OFF CL STBD TO SUIT DESIGN DEVELOPMENT OF MACHY SPACE ARRANGEMENT AS REQUESTED BY OUR MACHY GROUP ON 10-25-76.					
	4B'	3. INDICATION OF ROPE SCUTTLE OVER & VL TO SAME RELOCATED FROM FRS 132-133 STBD TO FRS 131-132 STBD TO AGREE WITH REF NO. 5.					
	7C'	4. GRATING ADDED FRS 23-25 P/S IN WAY OF MACHINERY SPACE TO SUIT DESIGN DEVELOPMENT OF MACHINERY SPACE ARRANGMENT.					
	4B', 4C'	5. SILL FOR ACCESS OPENING FRS 111-112 IN LONGT BHD 39'-0 1/8" OFF CL P/S ALTERED FROM 9" TO 45 1/2" AND LADDER RUNGS ADDED IN WAY OF SAME TO SUIT STRUCTURAL DEVELOPMENT AS SHOWN ON DWG NO. 1030-549.					
	3C', 4C'	6. ACCESS OPENING IN CL LONGT BHD RELOCATED FROM FRS 146-147 TO FRS 144-145 & SILL ALTERED FROM 9" TO 41" AND SILL FOR ACCESS OPENING FRS 111-112 ALTERED FROM 9" TO 11" TO SUIT STRUCTURAL DEVELOPMENT AS SHOWN ON DWG NO. 1030-479.					
	6A', 7B'	7. VL IN WAY OF MHO FRS 45-47 STBD RELOCATED FROM FWD TO AFT SIDE OF MHO & VL IN WAY OF MHO FRS 23-25 STBD RELOCATED FROM AFT TO FWD SIDE OF MHO TO FACILITATE INSTALLATION OF OVERBOARD PIPES AS REQUESTED BY OUR PIPING ENGINEERS.					
	6C'	8. IN ENGINEERS STOREROOM FRS 44-50 PORT, INBD BHD RELOCATED & MODIFIED, DOOR RELOCATED AND SHELVING ADDED TO SUIT DEVELOPMENT AS SHOWN ON DWG NO 7700-625.					
	4C'	9. ARRANGEMENT OF BOATSWAINS STOREROOM & CORDAGE SPACE FWD OF FR 124 ADDED TO SUIT DEVELOPMENT AS SHOWN ON DWG NO. 7700-649.					
	7B', 7C'	10. ARRANGEMENT OF BOATSWAIN STORES AFT OF FR 23 PORT AND CORDAGE SPACE AFT OF FR 23 STBD ADDED TO SUIT DEVELOPMENT AS SHOWN ON DWG NO. 7700-628.	JB C.	7/12/77	JMH	LET.	OF 11-23-77
E	6A', 6B', 7A'	1. INDICATION OF TANK CLEANING OPENING OVER IN WAY OF SW BALLAST TANK FRS 23-47 P/S DELETED & INDICATION OF TANK CLEANING OPENING OVER ADDED IN WAY OF LOW SULPHUR FUEL OIL TANK FRS 47-50 STBD & DIESEL OIL TANK FRS 47-50 PORT TO AGREE WITH REF 6.					
	6B'	2. INDICATION OF GRATING OVER FRS 39-42 STBD IN WAY OF LO STORAGE & SETTLING TANK ADDED TO SUIT DESIGN DEVELOPMENT. VERTICAL LADDERS IN WAY OF SAME REVISED & RELOCATED TO SUIT.					
	6A', 6B'	3. OPENING FOR TANK CLEANING MACHINE ADDED IN 78'-4" FLAT FRS 56-57 P/S IN WAY OF FUEL OIL TANK & FRS 48-49 STBD IN WAY OF LOW SULPHUR FUEL OIL TANK TO FACILITATE TANK CLEANING.					
	7B'	4. VERTICAL LADDER FRS 24-25 PORT RELOCATED FROM AFT TO FWD SIDE OF MANHOLE OVER TO CLEAR OVERBOARD DRAIN PIPE FROM INERT GAS SCRUBBER.					
	8B'	5. STANCHION ADDED FR-7 CL TO SUIT STRUCTURAL DEVELOPMENT AS INDICATED ON DWG NO. 1230-63.	JDC	5-1-78	JMH		

REVISIONS

REV	ZONE	DESCRIPTION		NNS & DD CO DATE	NNS & DD CO AUTH'D	OWNER DATE	OWNER APP'D
A		PLAN REVISED THROUGHOUT TO SUIT CHECKING.	EP JDB				
B	1-C'	1. PLAN MADE APPLICABLE TO HULL 615C ONLY AND NOTE NO. 2 ADDED.					
	4-B', 4-C'	2. INDICATION OF HAWSE PIPE OVER FRS 136-140 P/S REVISED TO SUIT DESIGN DEVELOPMENT.					
	4-B'	3. INDICATION OF ROPE SCUTTLE OVER FRS 131-132 STBD RELOCATED TO FRS 136-137 STBD TO SUIT DEVELOPMENT OF MOORING ARRGT ON UPPER DECK OVER.					
	4-B'	4. FWD BHD OF CHAIN LOCKER RELOCATED FROM FR129 TO FR130 TO PROVIDE REQUIRED SPACE FOR STORAGE OF SPECIFIED QUANTITY OF CHAIN.					
	4-B'	5. INDICATION OF MANHOLES OVER IN WAY OF CHAIN LOCKER DELETED, FOOTHOLES FOR ACCESS TO CHAIN LOCKER REVISED AND RELOCATED AND 18"x36" WT DOORS ADDED IN FWD BHD OF CHAIN LOCKER, ALL TO IMPROVE ACCESS TO CHAIN LOCKER.					
	4-B', 4-C'	6. MANHOLE FRS 136-137 STBD DELETED, 15"x23" ACCESS OPENING ADDED FRS 122-123 IN FLAT 87'-10" ABOVE BL AND INDICATION OF MANHOLE IN UPPER DECK OVER & VL IN WAY OF SAME ADDED FRS 116-117 P/S. ALL TO IMPROVE ACCESS TO FORE PEAK TANK.					
	4-C'	7. HYDRAULIC POWER PACK ROOM ADDED FRS 119-124 PORT ADJACENT TO CL TO SUIT DESIGN DEVELOPMENT OF ANCHOR HANDLING & MOORING EQUIPMENT.					
	4-C'	8. AREA FWD OF FR124 REDESIGNATED FROM BOATSWAIN STOREROOM TO BOATSWAIN STOREROOM & CORDAGE SPACE (CORRECTION).					
	4-C'	9. TRANSV WT BHD ADDED FR114 BET CL & LONG. BHD 39'-0 1/8" OFF CL PORT. LONG. BHD FRS 114-124 ON CL & 39'-0 1/8" OFF CL PORT ALTERED FROM NT TO WT. TRANSV BHD 124 BET 19'-0 1/4" & 39'-0 1/8" OFF CL PORT ALTERED FROM WT TO NT & ARCH ADDED IN SAME. INDICATION OF HATCHWAY OVER & IL IN WAY OF SAME ADDED FRS 115-120 ABOUT 20'-0" OFF CL PORT. ALL TO FACILITATE ACCESS INTO BOATSWAINS STORES AREA THROUGH BOOBY HATCH IN UPPER DECK AS REQUESTED BY OWNERS LETTER OF 4-23-75.					
	7-B', 8-B', 8-C'	10. 15"x23" WT MANHOLE ADDED FR-10 P/S IN 78'-4" FLAT & 30"x60" WT DOOR ADDED IN TRANSV BHD FR 23 AT 54" OFF CL STBD. ALL TO SUIT OWNERS LETTER OF 4-23-75.					
	5-B'	11. IN PLAN AT 94'-4" LEVEL LONG. BHD FR 50-57 AT 39'-0" OFF CL STBD EXTENDED UP TO UPPER DECK OVER & 23"x24" ACCESS OPENING ADDED FR 54-55 IN SAME TO SUIT STRUCTURAL DEVELOPMENT AS INDICATED ON DWG NO. 1210-640.					
	5-B', 5-C'	12. IN PLAN AT 94'-4" LEVEL, ACCESS OPENING IN TRANSV BHD FR 57 ABOUT 28'-9" OFF CL PORT, ACCESS OPENING IN TRANSV WEB FR 54 ABOUT 22'-6" OFF CL P/S & ABT 7'-6" OFF CL STBD AND ACCESS OPENING FRS 52-53 AND FRS 55-56 IN LONG. GIRDER 12'-0 1/2" OFF CL P/S ALTERED FROM 23"x15" TO 23"x18" TO IMPROVE ACCESS.					
	5-B', 6-B'	13. MANHOLES IN TOP OF POTABLE WATER TANK, DISTILLED WATER TANK, LUBE OIL SETTLING TANK & LUBE OIL STORAGE TANK ALTERED TO HINGED TYPE MANHOLE TO SUIT MANHOLE LIST, DWG NO. 1500-116.					
	5-B', 6-B'	14. IN PLAN AT 94'-4" LEVEL & 78'-4" FLAT ACCESS TO MACHINERY SPACE RELOCATED FROM BETWEEN 15'-0" & 18'-0" TO BET 36'-0" & 39'-0 1/8" OFF CL & REVISED TO SUIT DESIGN DEVELOPMENT OF ACCOMMODATIONS ARRGT ON CAMBER DECK OVER. TRANSV BHD WITH 18"x30" ACCESS OPENING IN SAME ADDED FR 50 BET. 15'-0" & 18'-0" OFF CL STBD TO SUIT.					
	6-C', 7-B'	15. 18"x23" ACCESS OPENING ABOUT 20" AFT OF FR 69 & 19'-9" OFF CL P/S IN 78'-4" FLAT RELOCATED TO 22'-6" OFF CL P/S TO IMPROVE ACCESS.					
	6-C'	16. INBOARD BHD OF FIRE PUMP ROOM ACCESS TRUNK BET FR 58 & 42" AFT OF BHD FR 58 RELOCATED FROM 42" TO 62" INBD OF LONG. BHD 39'-0 1/8" OFF CL PORT TO FACILITATE INSTALLATION OF VENTILATION TO PUMP ROOM.					
	6-A', 6-C'	17. INDICATION OF MANHOLE OVER FRS 46-47 & FRS 49-50 RELOCATED FROM ABOUT 69'-9" TO 64'-8" OFF CL P/S TO AGREE WITH UPPER DECK OVER. VL IN WAY OF SAME RELOCATED TO SUIT.					
	6-B'	18. TOP OF LUBE OIL STORAGE & SETTLING TANKS FRS 38-44 STBD RELOCATED FROM 16'-9" TO 16'-5" ABV 78'-4" FLAT TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 1210-639.					
	6-B', 6-C', 7-B'	19. ACCESS OPENING IN TRANSV BHD FR 38 & 44 JUST INBD OF LONG. BHD 39'-0 1/8" OFF CL STBD & IN TRANSV BHD FR 50 JUST INBD OF LONG. BHD 39'-0 1/8" OFF CL PORT ALTERED FROM 15"x23" TO 18"x30". ACCESS OPENINGS IN LONG. WEBS IN WAY OF FWD BHD OF DISTILLED & POTABLE WATER TANKS BET FRS 57-58 P/S ALTERED FROM 15"x23" TO 18"x30". ALL TO IMPROVE ACCESS.					
	6-B', 6-C'	20. INDICATION OF LADDER RUNGS IN WAY OF MHO FRS 56-57 PORT IN DISTILLED WATER TANK RELOCATED TO TRANSV BHD FR 60 IN WAY OF MHO TO IMPROVE ACCESS.					
	6-B'	21. VENTS IN PUMP ROOM ACCESS TRUNK FR 58 3/4-59 P/S REVISED TO SUIT DESIGN DEVELOPMENT OF VENTILATION.					
	6-B'	22. GRATINGS & INCLINED LADDERS ADDED IN PUMP ROOM ACCESS TRUNK FRS 58-59 P/S TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 9850-251 RESERVATION NO. 1 RELEASED TO SUIT.					
	6-B'	23. HATCHWAY FRS 44-47 AT 25'-6" OFF CL P/S ALTERED FROM 33"x66" TO 30"x66" TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 1040-91.					
	6-B'	24. 48"x48" OPENING IN 78'-4" FLAT FRS 38-41 STARBOARD ALTERED TO 60"x60" & RELOCATED TO 21'-0" OFF CL TO SUIT DESIGN DEVELOPMENT OF MACHINERY SPACE ARRANGEMENT AS REQUESTED BY OUR MACHINERY GROUP MEMO OF 11-21-75. GRATING BY ENGRS NOTED IN WAY OF SAME TO SUIT.					
	7-C'	25. DOOR TO BOATSWAIN STOREROOM FR 19 PORT ALTERED FROM EM TO METAL JOINER DOOR TO FACILITATE VENTILATING BOATSWAIN STOREROOM.					
	8-B'	26. MANHOLE FR4-5 STBD ALTERED FROM 15"x23" TO 15"x18" & RELOCATED TO 12" FWD OF FR4 & 17" OFF CL STBD TO SUIT DESIGN DEVELOPMENT AS SHOWN ON DWG NO. 1140-98.					
	7-B', 8-B'	27. COMPT AFT OF 23 OUTBD OF LONG. BHD 21'-0" OFF CL STBD REDESIGNATED CORDAGE SPACE IN LIEU OF BOATSWAINS STOREROOM TO SUIT DESIGN DEVELOPMENT. INDICATION OF ROPE SCUTTLE OVER & IL IN WAY OF SAME RELOCATED FROM FR-1 PORT TO FR-1 STBD TO SUIT.					
	7-B'	28. INDICATION OF HATCH OVER FRS 21-23, STBD RELOCATED FROM ABOUT 9'-0" TO ABOUT 15'-0" OFF CL TO AGREE WITH UPPER DECK OVER.					
	4-B' & 4-C', 7-B', 7-C'	29. FIRE STATION ADDED AT FR 9 STBD, FRS 21-23 P/S, & AT FRS 125-126 P/S TO SUIT DESIGN DEVELOPMENT OF FIRE MAIN SYSTEM AS INDICATED ON DWG NO. 2400-939.					
	6-B', 6-C', 7-B', 7-C'	30. STANCHION FR 64 RELOCATED FROM 64'-0" TO 62'-10 1/4" OFF CL PORT & STBD. STANCHION FR 36, 38, 41 & 44 RELOCATED FROM 60'-0" TO 58'-10 1/4" OFF CL P/S. STAN FR 26, 29 & 32 RELOCATED FROM 60'-0" OFF CL P/S TO OUTBD EDGE TO 60'-0" OFF CL TO INBD EDGE OF STANCHION. ALL TO SUIT STRUCTURAL DEVELOPMENT AS INDICATED ON DWG NO. 1230-65	EP C.	2/11/76	AC		
C	4-B', 4-C'	1. 2ND DECK: CHAIN LOCKERS RELOCATED FROM FRS 124-130 P/S TO FRS 110-116 P/S & HAWSE PIPE RELOCATED FROM FRS 136-140 P/S TO FRS 123-127 P/S AS AGREED WITH OWNERS REPRESENTATIVE IN MEETING OF 8-3-76. THE FOLLOWING REVISIONS MADE TO SUIT: HATCHWAY OVER & IL FRS 115-120 PORT RELOCATED TO FRS 119-124 STBD. EXTENT OF FORE PEAK TANK FRS 108-124 P/S REVISED. ROPE SCUTTLE OVER & VL FRS 136-137 STBD RELOCATED TO FRS 132-133 STBD. HATCH OVER FRS 140-143 PORT RELOCATED TO FRS 130-133 PORT. ARCH IN TRANSV BHD FR 124 AT 19'-9" OFF CL PORT DELETED & ARCH ADDED IN TRANSV BHD FR 124 AT 16'-9" OFF CL P/S.					
	5-B'	2. 23"x18" ACCESS OPENING ADDED IN TRANSV WEB FR 54 AT 31'-6" OFF CL STBD IN PLAN AT 94'-4" ABOVE BL TO IMPROVE ACCESS.					
	5-C', 6-C'	3. VERTICAL LADDER FRS 57-58 RELOCATED FROM 28'-6" TO 22'-6" OFF CL PORT & ACCESS OPENING IN TRANSV BHD FR 57 IN PLAN AT 94'-4" ABOVE BL RELOCATED FROM 28'-6" TO 22'-6" OFF CL PORT TO CLEAR PIPING AS REQUESTED BY OUR MACHINERY ENGRS.					
	5-B', 6-B'	4. TRANSV BHD ADDED FR 50 BET 36'-0 1/4" & 39'-0 1/8" OFF CL STBD TO SUIT STRUCTURAL DEVELOPMENT. 30"x72"x8'-6" SILL ARCH ADDED IN SAME & PLATFORM 88'-4" ABV BL BET 36'-0 1/4 & 39'-0 1/8" OFF CL STBD RELOCATED TO 86'-4" ABV BL & EXTENDED AFT TO ABT FR 49 AND INCLINED LADDERS IN WAY OF PLATFORM RELOCATED TO SUIT.					

REVISIONS CONTINUED AT LEFT

HULL APPLICABILITY	NO.	REFERENCES	DWG NO.
613C, 614C, & 615C	8	NAVIGATION BRIDGE & HOUSE TOP GENERAL ARRGT	0100-778
613C, 614C, & 615C	7	ACCOMMODATIONS GENERAL ARRANGEMENT IN DECKHOUSE	0100-774
615C	6	UPPER DECK AFT OF FRAME 81 GENERAL ARRANGEMENT	0100-773
615C	5	UPPER DECK FORWARD OF FRAME 81 GENERAL ARRANGEMENT	0100-772
615C	4	SECOND DECK FORWARD & 78'-4" FLAT AFT GENERAL ARRANGEMENT	0100-771
615C	3	33'-0" & 60'-0" FLAT AFT GENERAL ARRANGEMENT	0100-931
615C	2	HOLD AFT OF FRAME 81 GENERAL ARRANGEMENT	0100-769
615C	1	HOLD FORWARD OF FRAME 81 GENERAL ARRANGEMENT	0100-768

AUTHORITY:

GENERAL NOTES:

1. SILL HEIGHTS FOR ALL CLOSURES ARE TAKEN AT CL OF CLOSURE AND ABOVE STEEL DECK.
2. THIS PLAN IS SUPERSEDED & REPLACED BY DWG NO. 0100-917 FOR HULLS NO. 613C & 614C.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	

APPROVALS

OWNERS LETTER OF 4-23-75
USPH LETTER OF 4-3-75
USCG LET NO. 5940/NNS&DD HULLS 613-615 OF 2-26-76

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING DEPT

KEY PLAN

SCALE 1/8" = 1 FT
DRAWN E. PARKMAN
CHECKED J.D. BENTON, JR.-C.
SECT MGR A. Cowling
DATE COMPL. 2/11/75
EXAMINED
AUTHORIZED
DATE 3-11-75
TECH APPROVAL
C S D APPROVAL

390,000 DWT TANKER
SECOND DK FWD & 78'-4" FLAT AFT
GENERAL ARRANGEMENT

U S M A DESIGN T11-S-116a
~~U S M A DWG NO.~~
HULL NO. 311
DWG NO. 0100-771 (SEE NOTE NO. 2)
REV E
SHEET NO. 1 OF 1

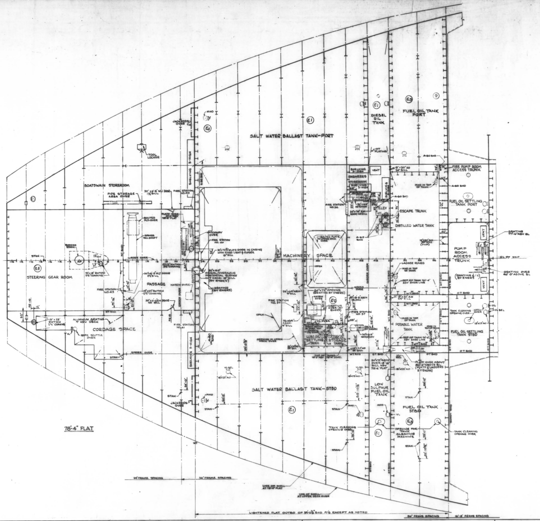
REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS BLUELINE PRINTS FROM AN AUTO-POSITIVE ~ CHARGE TO 613C-10079.
DATE 8-17-78 SIGNED A. Cowling

FIRST ISSUE	DEPT.	NO. PRTS.	REV.	DATE ISSUED	SPECIAL PRINTS
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

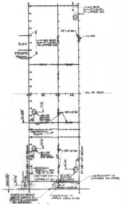
YARD PRINTS
ORDERED BY DESIGN
GROUP: MC NO.

0100-771

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
FRAME 1
10X


SALT WATER BALLAST TANK-PORT
DIESEL OIL TANK
FUEL OIL TANK PORT
JACKRODS OVER
MHO
E1
E4
E5
E2
E9
TOOL LOCKER
SHELVING 5-HIGH
BOATSWAIN STOREROOM
PIPE STORAGE AREA OVER
30"x16'5" MJ DOOR 1½" SILL
FIRE STATION NO.42
BOLTED FLY-OVER
SPARE TAILSHAFT
PLATF OVER 10'-0" ABV 78'-4" FLAT
HATCHWAY OVER
FIRE STATION NO. 40
30"x72½" MJFS DOOR IN CASING WITH FIXED LIGHT & CLOSER 9" SILL
RUDDER STOCK
STAN
AP
GIRDER OVER
WT BHD
STEERING GEAR ROOM
15"x18" RWTMH 2½" COAMING
PASSAGE
30"x58-6" MJ DOOR 1½" SILL
FIRE STATION NO.43
15"x23" RWTMH 2½" COAMING
30"x60" MANUAL/HYDRAULIC HORIZONTAL SLIDING WT DOOR-18" SILL (BY ENGRS)
GRATING (BY ENGRS)
HATCH OVER
30"x60"-6" EM DOOR NO SILL
FR-10
ALUMINUM GRATING 9" ABV DECK
15"x23" RWTMH 2½" COAMING
CORDAGE SPACE
RISE SCUTTLE OVER
VL
FIRE STATION NO.41
FR 19
MACHINERY SPACE
OPEN
FIRE STATION NO. 39
OPENING IN UPPER DECK OVER
SHELVING 5-HIGH
VENT
ENGINEERS STOREROOM
FIRE STATION NO.38
30"x60" HATCHWAY
30"x78" EM DOOR-NO SILL
ELEV
ESCAPE TRUNK
A-60 BHD
DISTILLED WATER TANK
BOLTED PLATE IN UPPER DECK OVER
60"x72" OPENING (GRATING BY ENGRS)
HATCH OVER
GRATING OVER (BY ENGRS)
26"x60" ARCH 9" SILL
FIRE STATION NO. 37
LUBE OIL SETTLING TANK
LUBE OIL STORAGE TANK
TOP OF TANKS 10'-0" ABV 78'-4" LEVEL
OT PLATING
18"x30" AO 24" SILL
FIRE PUMP ROOM ACCESS TRUNK
MHO IN TOP OF TANK
FUEL OIL SETTLING TANK PORT
GRATING 77'-6" ABV BL
PUMP ROOM ACCESS TRUNK
CL OF SHIP
LADDER RUNGS
TOP OF TANK 94'-4" ABV BASE LINE
GRATING OVER 80'-0" ABOVE BL
(GRATING & IL BY ENGRS)
OT BHD
WT BHD
POTABLE WATER TANK
TANK CLEANING OPENING OVER
HATCH OVER
VL BEL
18"x23" AO
FUEL OIL SETTLING TANK STBD
30"x72" ARCH OVER-8'-6" SILL ABV 78'-4" FLAT
PLATF OVER ABOUT 86'-4" ABOVE BL (PLATF & LADDERS BY ENGRS)
SALT WATER BALLAST TANK-STBD
LOW SULPHUR FUEL OIL TANK
FUEL OIL TANK STBD
TANK CLEANING OPENING OVER
OPENING FOR TANK CLEANING MACHINE
24" FRAME SPACING
30" FRAME SPACING
LINE OF SHELL AT 78'-4" FLAT
LINE OF SHELL AT UPPER DECK OVER
LIGHTENED FLAT OUTBD OF 39'-0⅜" BHD P/S EXCEPT AS NOTED
36" FRAME SPACING
16'-8" FRAME SPACING

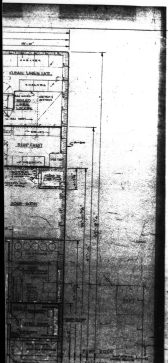
78'-4" FLAT


A-60 BHD 94'-4" LEVEL TO UPPER DK
25"x15" AO
VL-DN
ELEV
ESCAPE TRUNK
CL OF SHIP
15"x23" RWTMH 2½" COAM
CROSSOVER PLATF
NT ABV - WT BELOW
30"x72" ARCH 8'-6" SILL ABV 78'-4" FLAT
23"x24" AO
HATCHWAY IN CAMBER DK OVER
PLATF AT ABOUT 86'-4" ABOVE BL (PLATF & LADDERS BY ENGRS)
HATCHWAY IN UPPER DECK OVER

PLAN AT 94'-4" LEVEL-TOP OF WATER TANKS

0100-771

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 2



REV	ZONE	DESCRIPTION	NNS&DDCO DATE	NNS&DDCO AUTHO	OWNER DATE	OWNER APPD
0		INITIAL ISSUE				

AUTHORITY:

GENERAL NOTES:

1. SILL HEIGHT FOR ALL DOORS IS TAKEN AT ℄ OF DOOR AND ABOVE STEEL DECK.

ABBREVIATIONS

AC	ARM CHAIR
AP	ACCESS PANEL
AFD	AUTOMATIC FIRE DAMPER
BR	BOOKRACK
BR/RS	BOOKRACK RADIO SHELF
CD	CHEST OF DRAWERS
CT	CORNER TABLE
DBL CD	DOUBLE CHEST OF DRAWERS
DF	DRINKING FOUNTAIN
ET	END TABLE
FC	FILE CABINET
KL	KEY LOCKER
LC	LOUNGE CHAIR
LKR	LOCKER
LT	COFFEE TABLE
MACHY	MACHINERY
MJD	METAL JOINER DOOR
NT	NIGHT TABLE
RC	RECLINING CHAIR
RFRG	REFRIGERATOR
SAC	SWIVEL ARM CHAIR
SB	SIDE BOARD
SC	SIDE CHAIR
ST STL	STAINLESS STEEL
SS	SERVICE SINK
TC	TOILET CABINET
TL	TABLE LAMP
T/S	TOILET & SHOWER SPACE
WB	WASTE BASKET
WT	WEATHER TIGHT
WR	WARDROBE
VL	VERTICAL LADDER
WC	WATER CLOSET
LVRD	LOUVRED
SPFTD	SINGLE PEDESTAL FLAT TOP DESK

HULL APPLICABILITY	NO	REFERENCES	DWG NO
613C, 614C	14	UPPER DK AFT OF FR. 81 ~ GENERAL ARRANGEMENT	0100-909
613C, 614C	13	UPPER DK FWD OF FR. 81 ~ GENERAL ARRANGEMENT	0100-908
613C, 614C	12	SECOND DK FWD & 78'-4" FLAT AFT ~ GEN. ARRGT.	0100-917
615C	11	30'-0" & 60'-0" FLAT AFT ~ GENERAL ARRANGEMENT	0100-931
613C, 614C	10	HOLD AFT OF FR 81 ~ GENERAL ARRANGEMENT	0100-920
613C, 614C	9	HOLD FWD OF FR 81 ~ GENERAL ARRANGEMENT	0100-919
613C, 614C, 615C	8	NAV. BR. & HSE. TOP ~ GENERAL ARRANGEMENT	0100-778
613C, 614C, 615C	7	GENERAL ARRGT IN DECKHOUSE	0100-774
615C	6	UPPER DK AFT OF FR 81 ~ GENERAL ARRANGEMENT	0100-773
615C	5	UPPER DK FWD OF FR 81 ~ GENERAL ARRANGEMENT	0100-772
615C	4	SECOND DK FWD & 78'-4" FLAT AFT ~ GEN. ARRGT.	0100-771
613C, 614C	3	33'-0" & 60'-0" FLAT AFT ~ GENERAL ARRANGEMENT	0100-770
615C	2	HOLD AFT OF FR. 81 ~ GENERAL ARRANGEMENT	0100-769
615C	1	HOLD FWD OF FR. 81 ~ GENERAL ARRANGEMENT	0100-768

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS

OWNERS	USPH
NEWPORT NEWS	USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
DEPT

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.
KEY PLAN

SCALE 1/4" = 1 FT
DRAWN GLV
CHECKED E.G.
SECT MGR Getz
DATE COMPL. 3-3-78
EXAMINED
AUTHORIZED
DATE
TECH APPROVAL J. W. Halpin 4-7-78
C S D APPROVAL

GENERAL ARRANGEMENT
DECKHOUSE

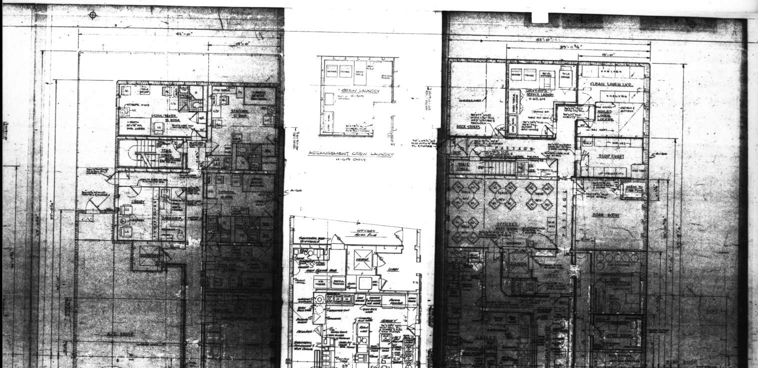
U S M A DESIGN T11-S-116a
U S M A DWG NO
HULL NO 613, 614, 615
DWG NO. 0100-774
REV 0
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS YES
GROUPING NO
REMARKS "CHARGE TO 613C-10079 ~ SEE BELOW ~
DATE 4-14-78
SIGNED GWC
YARD PRINTS
ORDERED BY DESIGN
GROUP:
MC NO.

0100-774

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80
FRAME 1
10X


42'-0"
15'-0"
COOK/BAKER
STAIR TOWER
LIBRARY
DARKROOM
A/C EQUIP
FAN ROOM
HOSPITAL
ELEVATOR
A-60
"A" DECK
110'-10" ABV. B @ ¢ SHIP
CREW LAUNDRY
H-615
WASHER
DRYER
WORK TABLE
IRONING BOARD
ARRANGEMENT CREW LAUNDRY
H-615 ONLY
OFFICERS
MESS ROOM
NIGHT SERVING AREA
ICE MAKER
REFRIG. FREEZER
LOBBY
GALLEY
PASSAGE
40" TABLE
CREW
MESS ROOM
SIDEBOARD
DRY PROVISION STOREROOM
ARRANGEMENT GALLEY & CREW MESS
615 ONLY
29'-11 3/4"
DECK STORES
CREW'S & SHIP'S SERVICE LAUNDRY
H-613, 614
CLEAN LINEN LKR.
SHELVES
SOILED LINEN LOCKER
SLOP CHEST
OFFICER'S MESS ROOM
FOAM ROOM
VENT
PUMP ROOM
ENTRANCE
DRY PROVISION STOREROOM
REFRIGERATED STOREROOM
CHILL 35°
REFRIGERATED STOREROOM
FREEZER
CAMBER DECK
101'-10" ABV. B @ ¢ SHIP

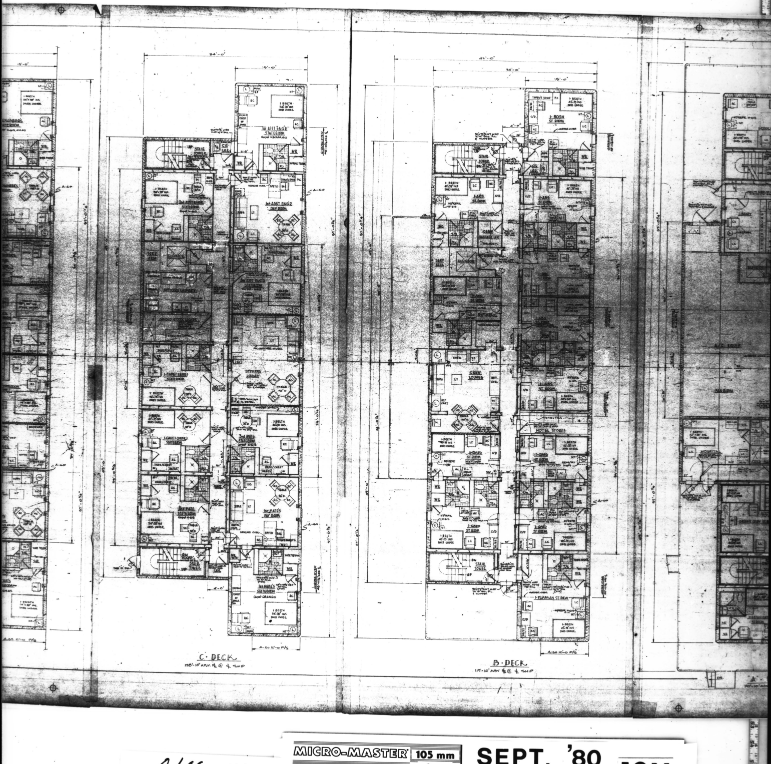
0100-774

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

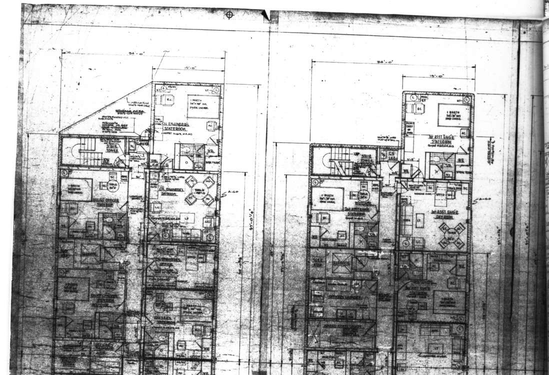
FRAME 2

10X


1st ASST ENGR STATEROOM
1st ASST ENGR DAYROOM
2nd ASST ENGR STATEROOM
STAIR TOWER
ELEVATOR
OFFICERS LAUNDRY
OFFICERS LOUNGE
1-CADET (DECK) STATEROOM
2nd MATE'S STATEROOM
1st MATE'S DAYROOM
1st MATE'S STATEROOM
1-BERTH
C·DECK
128'-10" ABV. BL @ ℄ SHIP
1-BOSN ST. ROOM
1-ABS ST. ROOM
CREW LOUNGE
HOTEL STORES
1-QMED ST. ROOM
1-WIPER ST. ROOM
B·DECK
119'-10" ABV BL @ ℄ SHIP
A/C SHOP
HOSPITAL
LIBRARY
34'-0"
15'-0"
42'-0"

0100-774

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
FRAME 3
10X

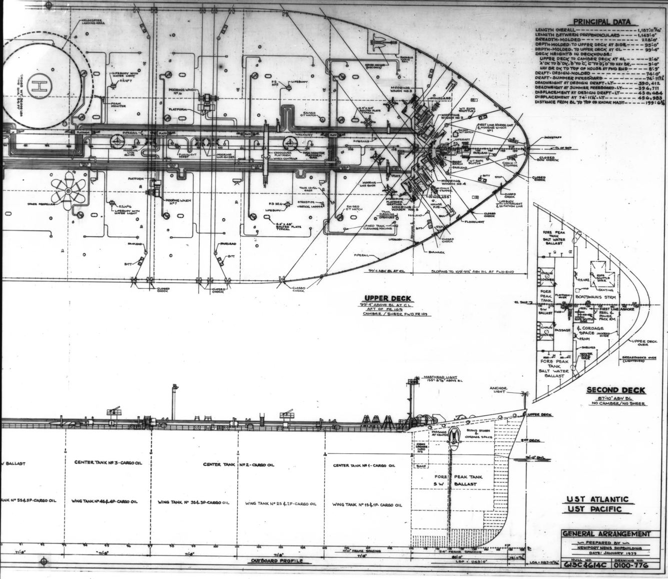

34'-0"
15'-0"
STORAGE AREA
STAIR TOWER
CH. ENGINEER'S STATEROOM
CH. ENGINEER'S DAYROOM
RELIEF OFFICER STATEROOM
RADIO ROOM
RADIO OPERATOR'S STRM
MASTER'S OFFICE
MASTER'S DAYROOM
MASTER'S STATEROOM
1 BERTH
D-DECK
137'-10" ABV B @ ℄ SHIP
1st ASST ENGR STATEROOM
1st ASST ENGR DAYROOM
2nd ASST ENGR STATEROOM
ELEVATOR
OFFICERS' LAUNDRY
1-CADET (ENG) STATEROOM
1-CADET (DECK) STATEROOM
OFFICERS' LOUNGE
2nd MATE STATEROOM
3rd MATE STATEROOM
1st MATE'S DAY ROOM
1st MATE'S STATEROOM
C-DECK
128'-10" ABV. B @ ℄ SHIP
A-60
A-60 10'-0 P/S

0100-774

SEPT. '80

FRAME 4

10X


HELICOPTER LANDING AREA
H
MOORING WINCH No 5
MOORING WINCH No 6
MOORING WINCH No 7
MOORING WINCH No 2
MOORING WINCH No 4
WINDLASS
FOAM MONITOR
PIPERAIL
WALKWAY
LIFEBUOY
SPARE PROPELLER
JACKSTAFF
CL OF SHIP
CLOSED CHOCK
CLOSED BOW CHOCK
CHAIN STOPPER
FLOODLIGHT
BULWARK
FAIRLEAD
BITT
99'-4" ABV BL AT CL
SLOPING TO 109'-9¼" ABV BL AT FWD END
UPPER DECK
99'-4" ABOVE BL AT C.L.
AFT OF FR 109
CAMBER / SHEER FWD FR 109
FORE PEAK TANK SALT WATER BALLAST
CHAIN LOCKER
FORE PEAK TANK SW BALLAST
PASSAGE
BOATSWAINS STRM
FIRST LINE REEL & POWER PACK RM
CORDAGE SPACE
UPPER DECK OVER
BREASTHOOKS OVER (LIGHTENED)
SECOND DECK
87'-10" ABV BL
NO CAMBER / NO SHEER
MASTHEAD LIGHT
ANCHOR LIGHT
UPPER DECK
2ND DECK
PASSAGE AT CENTER
BOSNS STORES & CORDAGE SPACE
SUMP
FORE PEAK TANK S W BALLAST
W BALLAST
CENTER TANK Nº 3 - CARGO OIL
CENTER TANK Nº 2 - CARGO OIL
CENTER TANK Nº 1 - CARGO OIL
WING TANK Nº 5S & 5P - CARGO OIL
WING TANK Nº 4S & 4P - CARGO OIL
WING TANK Nº 3S & 3P - CARGO OIL
WING TANK Nº 2S & 2P - CARGO OIL
WING TANK Nº 1S & 1P - CARGO OIL
71'-8"
17'-11" FRAME SPACING
24" FRAME SPACING
LBP = 1143'-0"
LOA = 1187'-11⁹⁄₁₆"
OUTBOARD PROFILE

PRINCIPAL DATA

LENGTH OVERALL	1,187'-11⁹⁄₁₆"
LENGTH BETWEEN PERPENDICULARS	1,143'-0"
BREADTH-MOLDED	228'-0"
DEPTH-MOLDED-TO UPPER DECK AT SIDE	95'-0"
DEPTH-MOLDED-TO UPPER DECK AT CL	99'-4"
DECK HEIGHTS IN DECKHOUSE:	
UPPER DECK TO CAMBER DECK AT CL	2'-6"
"A" DK TO "B" DK, "B" TO "C", "C" TO "D", "D" TO NAV BR,	9'-0"
NAV BR DK TO TOP OF HOUSE AT FWD END	8'-9"
DRAFT-DESIGN-MOLDED	74'-0"
DRAFT-SUMMER FREEBOARD	74'-11½"
DEADWEIGHT AT DESIGN DRAFT-LT	390,412
DEADWEIGHT AT SUMMER FREEBOARD-LT	396,711
DISPLACEMENT AT DESIGN DRAFT-LT	450,684
DISPLACEMENT AT 74'-11¼"-LT	456,983
DISTANCE FROM BL TO TOP OF RADAR MAST	199'-6¾"

UST ATLANTIC
UST PACIFIC

GENERAL ARRANGEMENT

PREPARED BY
NEWPORT NEWS SHIPBUILDING
DATE: JANUARY 1977

HULL NO.	DRAWING NO.
613C & 614C	0100-776

1

REVISIONS						
REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
A	1.	INITIAL ISSUE				
B	1.	PLAN UPDATED THRUOUT TO SUIT LATEST GENERAL ARRANGEMENT PLANS AND DESIGN DEVELOPMENT OF SYSTEMS.		AC	LET. 10.2175V OF 2.13.79	
C	1.	PLAN UPDATED THRUOUT TO SUIT LATEST GENERAL ARRANGEMENT PLANS AND DESIGN DEVELOPMENT OF SYSTEMS.				
	2.	BOLTED PLATE ADDED IN WAY OF EACH CARGO TANK TO IMPROVE ACCESS AND TO FACILITATE OVERHAUL OF PIPING SYSTEMS FOR 614 ONLY.				

AUTHORITY:

GENERAL NOTES:

D

C

B

A

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING No
REMARKS
CHARGE TO 614C. 10079
– SEE BELOW –
DATE 11-1-79 SIGNED

NNS&DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
G14C	310	
G13C	309	

APPROVALS
OWNERS
USPH LETTER OF 1-18-78
USCG MMT LET 16710/NNS 400 HULL 613-615; SER 5209 OF 2-13-78

GROUP: MC NO.

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPT.
FSCM NO. 43689

KEY PLAN

SCALE 1/16" = 1 FT
DRAWN E. PARKMAN-CORUM
CHECKED J.B. CORUM, JR
SECT MGR J.W. Hager 11-23-77
DATE COMPL. 11-23-77
EXAMINED
AUTHORIZED A. Conley
DATE 11-23-77
TECH APPROVAL
CSD APPROVAL R.L. Harrington

NO.	REFERENCES	DWG NO.
8	NAV BRIDGE & HOUSE TOP-GENERAL ARRGT	0100-778
7	ACCOMMODATIONS-GENL ARRGT IN DECKHOUSE	0100-774
6	UPPER DK AFT OF FR 81-GENERAL ARRGT	0100-909
5	UPPER DK FWD OF FR 81-GENERAL ARRGT	0100-908
4	SECOND DK FWD & 78'-4" FLAT AFT-GENL ARRGT	0100-917
3	33'-0" & 60'-0" FLAT AFT-GENERAL ARRGT	0100-770
2	HOLD AFT OF FR 81-GENERAL ARRANGEMENT	0100-920
1	HOLD FWD OF FR 81-GENERAL ARRANGEMENT	0100-919

390,000 DWT TANKER
PROFILE AND
DECK ARRANGEMENTS

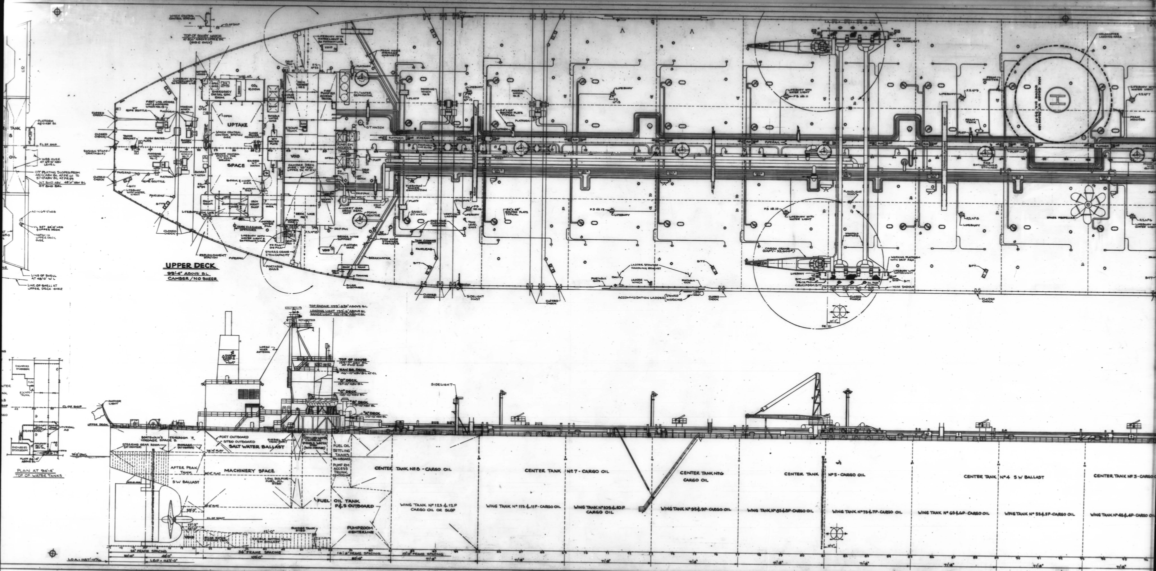
USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO. 309, 310

DWG NO.	REV	SHEET NO.
0100-776	C	1 OF 1

1

0100-776

SEPT. '80
10X
FRAME 1


UPPER DECK
99'-4" ABOVE BL
CAMBER / NO SHEER
UPTAKE
SPACE
CO2 ROOM
VOID
CARGO CRANE
MAX GROSS WT. 39,000 LBS ROTOR DIA. 56 FT
SPARE PROPELLER
ACCOMMODATION LADDER
SIDELIGHT
SALT WATER BALLAST
MACHINERY SPACE
AFTER PEAK TANK
S W BALLAST
FUEL OIL SETTLING TANKS
PUMP RM ACCESS TRUNK CENTERLINE
FUEL OIL TANK P & S OUTBOARD
PUMPROOM CENTERLINE
CENTER TANK No 8 - CARGO OIL
CENTER TANK No 7 - CARGO OIL
CENTER TANK No 6 CARGO OIL
CENTER TANK No 5 - CARGO OIL
CENTER TANK No 4 S W BALLAST
CENTER TANK No 3 - CARGO
WING TANK No 12S & 12P CARGO OIL OR SLOP
WING TANK No 11S & 11P - CARGO OIL
WING TANK No 10S & 10P CARGO OIL
WING TANK No 9S & 9P - CARGO OIL
WING TANK No 8S & 8P - CARGO OIL
WING TANK No 7S & 7P - CARGO OIL
WING TANK No 6S & 6P - CARGO OIL
WING TANK No 5S & 5P - CARGO OIL
WING TANK No 4S & 4P - CARGO
PLAN AT 84'-4"
TOP OF WATER TANKS
36" FRAME SPACING
LOA = 1187'-11¾"
LBP = 1143'-0"

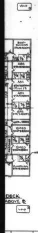
0100-776

MICRO-MASTER® 105 mm

SEPT. '80

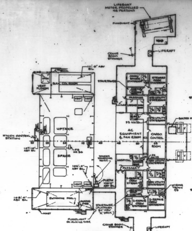
10X

FRAME 2



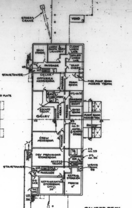
BOATSWAINS STATEROOM
ABS STATEROOM
QMED STATEROOM
PUMPMAN STATEROOM

DECK
ABOVE BL



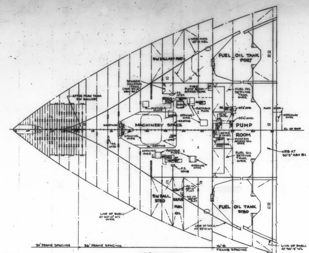
LIFEBOAT MOTOR PROPELLED 46 PERSONS
LIFERAFT
UPTAKE
SPACE
SWIMMING POOL
A.C. EQUIPMENT & FAN ROOM
CARGO CONTROL
HOSPITAL
WINCH CONTROL STATION
STAIRTOWER
VOID
LIFEBOAT

"A" DECK
110'-10" ABOVE BL



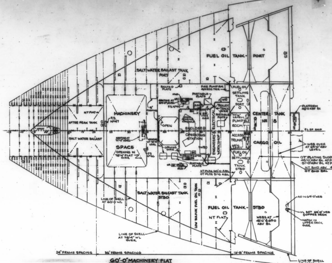
STORES CRANE
VOID
GALLEY
CREW MESSROOM
OFFICERS MESSROOM
DRY PROVISIONS STOREROOM
REFRIGERATED STOREROOM
STAIRTOWER

CAMBER DECK
101'-10" ABOVE BL



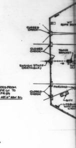
SW BALLAST PORT
FUEL OIL TANK PORT
MACHINERY SPACE
PUMP ROOM
SW BALL. STBD
SULFUR FUEL OIL
FUEL OIL TANK STBD
AFTER PEAK TANK SW BALLAST
24" FRAME SPACING
36" FRAME SPACING
16'-8"

33'-0" MACHINERY FLAT

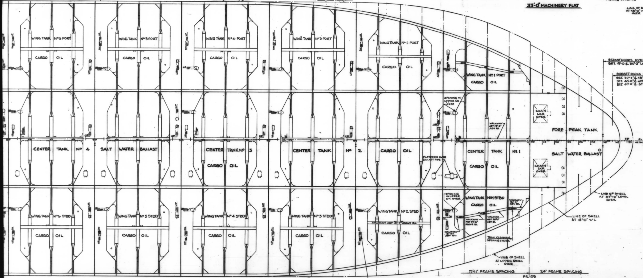


SALT WATER BALLAST TANK PORT
FUEL OIL TANK - PORT
MACHINERY SPACE
AFTER PEAK TANK
SALT WATER BALLAST
ENCLOSED OPERATING STATION
CENTER TANK Nº 8
CARGO OIL
PUMP ROOM
SALT WATER BALLAST TANK STBD
FUEL OIL TANK - STBD
LOW SULFUR FUEL OIL TANK
24" FRAME SPACING
36" FRAME SPACING
16'-8" FRAME SPACING

60'-0" MACHINERY FLAT

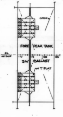


CLOSED CHOCK
ENSIGN STAFF (PORTABLE)
FAIRLEAD



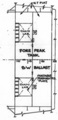
WING TANK Nº 6 PORT
WING TANK Nº 5 PORT
WING TANK Nº 4 PORT
WING TANK Nº 3 PORT
WING TANK Nº 2 PORT
WING TANK Nº 1 PORT
CARGO OIL
CENTER TANK Nº 4 SALT WATER BALLAST
CENTER TANK Nº 3 CARGO OIL
CENTER TANK Nº 2 CARGO OIL
CENTER TANK Nº 1 CARGO OIL
FORE PEAK TANK SALT WATER BALLAST
CHAIN LKR. OVER
WING TANK Nº 6 STBD
WING TANK Nº 5 STBD
WING TANK Nº 4 STBD
WING TANK Nº 3 STBD
WING TANK Nº 2 STBD
WING TANK Nº 1 STBD
BREASTHOOKS OVER
17'-11" FRAME SPACING
24" FRAME SPACING
FR. 109

HOLD



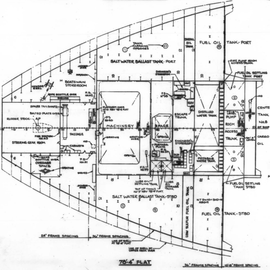
FORE PEAK TANK
SW BALLAST

BOTTOM OF CHAIN LOCKER SUMP
66'-0" ABOVE BASELINE



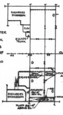
FORE PEAK TANK
SW BALLAST
CHAIN LKR.

BOTTOM OF CHAIN LOCKER
69'-0" NT FLAT



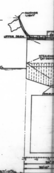
FUEL OIL TANK - PORT
SALT WATER BALLAST TANK - PORT
BOATSWAIN STOREROOM
STEERING GEAR ROOM
MACHINERY SPACE
DISTILLED WATER TANK
POTABLE WATER TANK
PUMP ROOM
CENTER TANK Nº 8 CARGO OIL
SALT WATER BALLAST TANK - STBD
FUEL OIL TANK - STBD
24" FRAME SPACING
36" FRAME SPACING

78'-4" FLAT



ENGINEERS STOREROOM
ESCAPE TRUNK

PLAN AT 94'-4"
TOP OF WATER TANKS



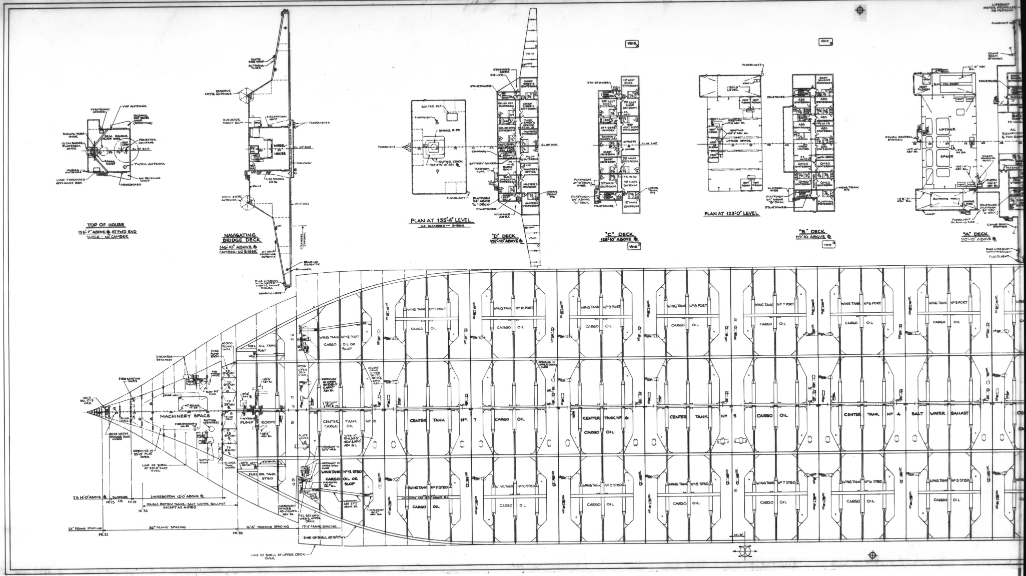
ANCHOR LIGHT
UPPER DECK

0100-776

SEPT. '80

10X

FRAME 3


TOP OF HOUSE
155'-7" ABOVE ℄ AT FWD END
SHEER - NO CAMBER
SIGNAL YARD OVER
PYROTECHNIC LOCKER
VHF ANTENNA
3CM RADAR PLATF OVER
10 CM RADAR PLATFORM OVER
PROJECTOR COMPASS
CL OF SHIP
RADAR MAST
TV/FM ANTENNA
OMEGA ANTENNA
AM RECEIVING WHIP
LINE THROWING APPLIANCE BOX
NAMEBOARD
NAVIGATING BRIDGE DECK
146'-10" ABOVE ℄
CAMBER-NO SHEER
RESERVE XMTG ANTENNA
ELEVATOR MACHY ROOM
FIRE STATION NO.17
FLOODLIGHTS
WHEEL-HOUSE
WALKWAY
FIRE STATION NO.16
RAILS
MAIN XMTG ANTENNA
VENTURI
HF WHIP RECEIVING ANTENNA
BEARING REPEATER
BULWARK
RING LIFEBUOY WITH WATER LIGHT & SMOKE SIGNAL
SEARCHLIGHT
PLAN AT 135'-4" LEVEL
NO CAMBER — SHEER
BOLTED PLT
FLOODLIGHT
SMOKE PIPE
OUTER STACK
"D" DECK
157'-10" ABOVE ℄
STORAGE AREA
CHIEF ENGR'S STATEROOM
CHIEF ENGR'S DAYROOM
CHIEF ENGR'S OFFICE
OWNER'S STATEROOM
PILOT STATEROOM
RADIO OPERATOR STATEROOM
MASTER'S OFFICE
MASTER'S DAYROOM
MASTER'S STATEROOM
BATTERY LOCKER
PLATFORM 54" ABOVE "C" DECK
STAIRTOWER
WIRING TRUNK P/S
VOID
"C" DECK
128'-10" ABOVE ℄
1ST ASST ENGR STATEROOM
1ST ASST ENGR DAYROOM
2ND ASST ENGR STATEROOM
OFFICERS LAUNDRY
OFFICER'S LOUNGE
CADET STATEROOM
2ND MATE STATEROOM
1ST MATE DAYROOM
1ST MATE STATEROOM
3RD MATE STATEROOM
PLATFORM AT "D" DECK OVER
PLATFORM 54" ABOVE "C" DECK
PLAN AT 123'-0" LEVEL
130'-0" LEVEL
UPTAKE SPACE
VENT PLENUM
"B" DECK
119'-10 ABOVE ℄
ABS STATEROOM
BOATSWAINS STATEROOM
CREW LOUNGE
QMED STATEROOM
PUMPMAN STATEROOM
PASSAGE
PLATFORM OVER
PLATFORM 54" ABOVE "B" DECK
"A" DECK
110'-10" ABOVE ℄
UPTAKE SPACE
WINCH CONTROL STATION
SWIMMING POOL
AWNING OVER
MAST
FLOODLIGHT ON AWNING OVER
STAIRTOWER (PLATFORM 54" ABV "A" DECK)
CRANE BOOM STOWAGE
RING LIFEBUOY WITH WATERLIGHT
FLOODLIGHT
HOSPITAL
A.C. EQUIPMENT & FAN ROOM
LIFEBOAT MOTOR PROPELLED 48 PERSONS
VOID 9EL 17'-3" WEB
BILGE WELL
BILGE WATER STORAGE TANK UNDER
FIRE STATION No.53
DISCHARGE SEACHEST
MACHINERY SPACE
SUCTION SEACHEST
FIRE PUMP ROOM
ACCESS TRUNK OVER
PUMP ROOM
OPENING IN 33'-0" FLAT OVER
LINE OF SHELL AT 33'-0" FLAT OVER
SUPPLY SCOOP
SLUDGE TANK UNDER
FUEL OIL TANK PORT
FUEL OIL TANK STBD
WING TANK No 12 PORT CARGO OIL OR SLOP
WING TANK No 12 STBD CARGO OIL OR SLOP
CENTER TANK No 8 CARGO OIL
WING TANK No 11 PORT CARGO OIL
WING TANK No 10 PORT CARGO OIL
WING TANK No 9 PORT CARGO OIL
WING TANK No 8 PORT CARGO OIL
WING TANK No 7 PORT CARGO OIL
WING TANK No 6 PORT CARGO OIL
WING TANK No 5 PORT CARGO OIL
CENTER TANK No 7 CARGO OIL
CENTER TANK No 6 CARGO OIL
CENTER TANK No 5 CARGO OIL
CENTER TANK No 4 SALT WATER BALLAST
WING TANK No 11 STBD CARGO OIL
WING TANK No 10 STBD CARGO OIL
WING TANK No 9 STBD CARGO OIL
WING TANK No 8 STBD CARGO OIL
WING TANK No 7 STBD CARGO OIL
WING TANK No 6 STBD CARGO OIL
WING TANK No 5 STBD CARGO OIL
OPENING IN UPPER DECK OVER
I.B. 14'-0" ABOVE ℄
SLOPING I.B.
INNERBOTTOM 12'-0" ABOVE ℄
DOUBLE BOTTOM TANKS - SALT WATER BALLAST EXCEPT AS NOTED
FR 23
FR 29
FR 52
FR 58
FR 21
24" FRAME SPACING
36" FRAME SPACING
16'-8" FRAMING SPACING
17'-11" FRAME SPACING
LINE OF SHELL AT 15'-0" W.L.
LINE OF SHELL AT UPPER DECK OVER

0100-776

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

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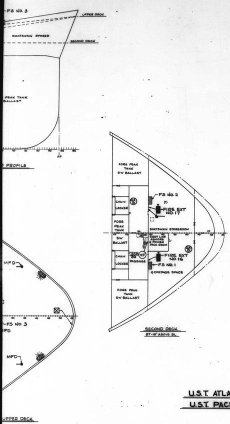
FRAME 4

10X



CAPACITY LIST

1- FIRE PUMP, TURBINE DRIVEN, 1,925 GPM, 175# PSIG, IN MACHINERY SPACE
1- FIRE PUMP, MOTOR DRIVEN, 1,925 GPM, 175# PSIG, IN FIRE PUMP ROOM

FIRE EXTINGUISHING (WATER)

- ▨ — 1½" HOSE RACK, 1½" HOSE VALVE, 50'-0" 1½" HOSE, 1½" SPANNER, 1½" ALL PURPOSE NOZZLE.
- ☒ — 2½" HOSE RACK, 2½" HOSE VALVE, 75'-0" 2½" HOSE, 2½" SPANNER, 2½" ALL PURPOSE NOZZLE
- ▬ — 2½" HOSE RACK, 2½" HOSE VALVE, 75'-0" 2½" HOSE, 2½" SPANNER, 2½" ALL PURPOSE NOZZLE, 12'-0" APPLICATOR
- ◪ — 1½" HOSE RACK, 1½" HOSE VALVE, 50'-0" 1½" HOSE, 1½" SPANNER, 1½" ALL PURPOSE NOZZLE, 48" APPLICATOR
- ■ — 2½" HOSE RACK, 2½" HOSE VALVE, 50'-0" 2½" HOSE, 2½" SPANNER, 2½" ALL PURPOSE NOZZLE
- ◩ — 1½" HOSE RACK, 1½" HOSE VALVE, (4) 50'-0" 1½" HOSE, 1½" SPANNER, 1½" ALL PURPOSE NOZZLE, 48" APPLICATOR
- (FP) — FIRE PUMP (EFP) — EMERGENCY FIRE PUMP
- ☒ — FOAM HOSE VALVE

FIRE EXTINGUISHERS

	NO.
▮ — 10# DRY CHEMICAL EXTINGUISHER	36
▮ — 125# DRY CHEMICAL EXTINGUISHER WITH 100'-0" HOSE	1
▮ — 100# CO2 EXTINGUISHER WITH 80'-0" HOSE (B.V)	1

SPARES FOR FIRE EXTINGUISHERS

	NO.
SPARE CHARGES FOR 125# DRY CHEMICAL EXTINGUISHER	1
SPARE 10# DRY CHEMICAL EXTINGUISHER (STOWED IN DECK LOCKER NO. 1)	1

MISCELLANEOUS

	NO
FIRE AXE WITH SPIKE END	5
LIFEBUOY	14
LIFEBUOY WITH WATERLIGHT	10
LIFEBUOY WITH WATERLIGHT & 20 FATHOM LINE	4
LIFEBUOY WITH WATERLIGHT, SELF-ACTIVATING SMOKE SIGNAL AND QUICK RELEASE DEVICE FROM BRIDGE	2
LTA LINE THROWING APPLIANCE (IMPULSE PROJECTED ROCKET TYPE)	1
RF 12 HAND-HELD RED FLARE DISTRESS SIGNALS AND 12 HAND-HELD ROCKET PROPELLED PARACHUTE RED FLARE DISTRESS SIGNALS STOWED IN PYROTECHNIC LOCKER ON HOUSE TOP	
DCL EMERGENCY OUTFIT CONSISTING OF FRESH AIR BREATHING APPARATUS (ONE SPARE OXYGEN BOTTLE) WITH BRONZE OR STEEL LIFELINE & HARNESS, EXPLOSION PROOF FLASHLIGHT, FIRE AXE & COMPLETE FIREMANS OUTFIT (SUIT, GLOVES, HELMET, ETC) STOWED IN DAMAGE CONTROL LOCKERS	2
COMBUSTIBLE GAS INDICATOR (46 CFR 35. 30-15)	1

ALL OFFICER & CREW STATEROOMS, OWNERS STATEROOM AND HOSPITAL ARE FITTED WITH ONE (1) LIFE PRESERVER PER PERSON (40) REQUIRED.
SIX (6) LIFE PRESERVERS ARE STOWED IN MACHINERY SPACE AND FOUR (4) ARE STOWED IN WHEELHOUSE (10 REQUIRED).
SIX (5) LIFE PRESERVERS FOR BOW AREA STOWED ON UPPER DK FWD IN BOOBY HATCH. ONE (1) LIFE PRESERVER FOR BOW LOOKOUT IS STOWED ON UPPER DECK FORWARD.
TOTAL REQUIRED ---------- 56

ALL DECKS, UPPER DECK AND ABOVE, ARE OF CLASS "A" CONSTRUCTION EXCEPT IN WAY OF STAIRTOWERS AND AS NOTED.

- ━ CLASS "A" BULKHEAD AND CLASS "A-60" AS NOTED
- ━ CLASS "B" BULKHEAD
- FSD — FIRE SCREEN DOOR
- FSDC — FIRE SCREEN DOOR MAGNETICALLY CONTROLLED
- (GAB) — GENERAL ALARM BELL
- (VF) — VENTILATION FAN
- MFD MANUAL FIRE DAMPER
- AFD AUTOMATIC FIRE DAMPER
- BOILERS ARE PROTECTED BY STEAM SMOTHERING SYSTEM
- FIREMAIN SOLAS INTERNATIONAL SHORE CONNECTION FLANGE ---------- 1
- ☒ — LIFE PRESERVER STORAGE RACK

U.S.T. ATLANTIC
U.S.T. PACIFIC

FIRE CONTROL PLAN
PREPARED BY
NEWPORT NEWS SHIPBUILDING & DRYDOCK CO.
NEWPORT NEWS, VIRGINIA
10-22-79

HULL NUMBER	DRAWING NUMBER
613C & 614C	0100-777

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH	OWNER DATE	OWNER APPD
A	1.	INITIAL ISSUE.			☒	☒
B	1.	PLAN APPROVED FOR FIRE PROTECTION BY OWNERS LETTER 1044V OF SEPTEMBER 17, 1976.				
	2.	AFT BHD OF GYRO ROOM ON CAMBER DECK & INBD BHD OF ELEVATOR MACHINERY SPACE ON NAV BRIDGE DECK NOTED TO BE CLASS "A" CONSTRUCTION. ENCLOSURE BHDS OF ESCAPE TRUNK FRS 48-50 PORT ON 78'-4" FLAT & FWD BHD OF BOOBY HATCH FR 23 PORT ON UPPER DECK NOTED TO BE CLASS A-60 CONSTRUCTION. PORTION OF NAV BRIDGE DECK IN WAY OF RADIO ROOM & BATTERY LOCKER BELOW ALTERED FROM CLASS A-15 TO A-30 CONSTRUCTION. DECK IN WAY OF BATTERY LOCKER FRS 48-52 STBD ON "D" DECK NOTED TO BE CLASS A-15 CONSTRUCTION. ALL TO SUIT USCG MMT LETTER 5940/NNS & DD HULLS 613-615; SERIAL: 3165 OF AUGUST 4, 1976.				
	3.	CLASS A-60 CONSTRUCTION DELETED FROM NAV BR DECK FR 58 TO 10'-0" AFT OF FR 58 BETWEEN 18'-0" & 27'-0" OFF CL P/S AS DISCUSSED WITH USCG MMT OFFICE ON AUGUST 17, 1976.	9-17-76 C.	AC	☒	☒
C	1.	PLAN UPDATED THRUOUT TO SUIT LATEST GENERAL ARRANGEMENT PLANS.				
	2.	"D" DECK: INBD & FWD BHD OF ADDED STOREROOM FRS 46½-53 P/S NOTED TO BE "A" CLASS CONSTRUCTION.				
	3.	"A" DECK: AFT BHD OF LIBRARY IN WAY OF AC EQUIP AND FAN ROOM NOTED TO BE "A" CLASS CONSTRUCTION TO SUIT USCG LET 16710/NNS & DD HULLS 613-614; SER 3478 OF 10-22-76.				
	4.	"A" DECK: DECK IN BULK CO2 ROOM, FRS 33-38 PORT, IN WAY OF CO2 ROOM BELOW NOTED TO BE "A-30" CLASS CONSTRUCTION TO SUIT VERBAL REQUEST OF USCG (MMT) ON 2-23-77.				
	5.	FIRE FIGHTING AND ALARM SYSTEMS, EMERGENCY SHUTDOWN STATIONS, LIFE SAVING APPLIANCES AND EMERGENCY EQUIPMENT ADDED THRUOUT TO SUIT DESIGN DEVELOPMENT OF SYSTEMS.	JBC	[illegible]	7-11-78	☒
D	1.	PLAN UPDATED THRUOUT TO SUIT LATEST GENERAL ARRANGEMENT PLANS & TO SUIT DESIGN DEVELOPMENT.				
	2.	"D" DECK: AUTOMATIC FIRE DAMPERS ADDED IN WAY OF VENT INLET & VENT OUTLET FOR STORAGE AREA FRS 46½-53 P/S TO SUIT DESIGN DEVELOPMENT OF VENTILATION.				
	3.	TWENTY FATHOM LINE ADDED FOR RING LIFEBUOY FR 42 P/S. WATERLIGHT ADDED FOR RING LIFEBUOY FR 84 PORT. RING LIFEBUOY WITH WATERLIGHT FRS 69-70 P/S INTERCHANGED WITH RING LIFEBUOY FRS 95-96 P/S. PORTABLE FIRE EXTINGUISHER FOR CARGO PUMP ROOM RELOCATED FROM UPPER DECK TO 15'-0" LEVEL IN PUMP ROOM. PORTABLE FIRE EXTINGUISHER ADDED IN CARGO CONTROL ROOM ON "A" DECK, IN ENGINEERS WORKSHOP ON 60'-0" MACHY FLAT AND FRS 44-45 PORT ON 60'-0" MACHY FLAT NEAR GENERATORS. PORTABLE FIRE EXTINGUISHER ON 60'-0" MACHY FLAT RELOCATED FROM AFT BHD OF ELEVATOR TO FR 49 PORT INSIDE OF ENCLOSED OPERATING STATION. FIRE AXE FRS 47-48 ON STBD BHD OF ENCLOSED OPERATING STATION ON 60'-0" MACHY FLAT RELOCATED TO FR 45 PORT INSIDE OF ENCLOSED OPERATING STATION. LOCATION OF LIFE PRESERVER STORAGE RACK ADDED IN MACHY SPACE ON 60'-0" FLAT AND ON 78'-4" FLAT, IN WHEELHOUSE P/S AND IN BOOBY HATCH ON UPPER DECK FWD. ALL TO SUIT OWNERS APPROVAL LET NO. 2040V OF 9-7-78. PORTABLE FIRE EXTINGUISHERS THRUOUT RENUMBERED TO SUIT.				
	4.	60'-0" MACHY FLAT: FIRE DAMPERS IN SUPPLY AND EXHAUST VENTILATION SYSTEM IN ENCLOSED OPERATING STATION ALTERED FROM MANUAL TO AUTOMATIC TO AGREE WITH DWG NO. 2680-579.				
	5.	60'-0" MACHY FLAT: GENERAL ALARM CONTACT MAKER IN ENCLOSED OPERATING STATION RELOCATED FROM STBD TO PORT SIDE OF ROOM TO SUIT DESIGN DEVELOPMENT.	JBC	[illegible]	[illegible]	LET NO 2184V OF 12-22-78
E	1.	CAMBER DECK: FIRE DETECTION ALARM DELETED FROM THE FIRE FIGHTING STATION FRS 54-55 STBD TO SUIT NEWPORT NEWS CHANGE NO. 139 OF 1-15-79.				
	2.	NAV BR DK: FIRE DAMPER IN OUTBD BHD OF ELEVATOR MACHY ROOM ALTERED FROM MANUAL TO AUTOMATIC DAMPER TO SUIT INSTALLATION ON SHIP.				
	3.	60'-0" FLAT: FIRE EXTINGUISHER NO. 29 (B-V) RELOCATED FROM FRS 39-40 STBD TO FRS 35-37 ABOUT 18'-0" OFF CL PORT TO IMPROVE SYSTEM COVERAGE IN MACHY SPACE.				
	4.	WATER APPLICATORS ON UPPER DECK ALTERED FROM 10'-0" TO 12'-0" TO SUIT USCG (MMT) LETTER NO. 6399/6404 OF 10-31-78 AND AS INDICATED ON DWG NO. 2400-959.				
	5.	10# DRY CHEMICAL FIRE EXTING ADDED IN PORT SIDE OF CARGO CONTROL RM ON "A" DK, IN AFT END OF STEERING GEAR RM ON 78'-4" FLAT & FRS 24-25 PORT ON 106'-0" LVL. GENERAL ALARM ROTATING BEACON ADDED ABOUT FRS 35-36 NEAR CL ON THE 106'-0" LEVEL. LIFE PRESERVER FOR BOW LOOKOUT ADDED ON UPPER DECK FORWARD NEAR LOOKOUT STATION. VERTICAL LADDER ADDED ON STBD SIDE OF FOAM MONITOR PLATFORM NO. 1, 5, 8, 11, 14 & 17 ON UPPER DECK. ADDITIONAL ACCESS TO LIFEBOAT ADDED FRS 47-53 STBD FROM PLATFORM BETWEEN "C" & "D" DECK TO "A" DECK. ALL TO PROVIDE IMPROVED SAFETY FACILITIES FOR SHIPS PERSONNEL AS REQUESTED BY LOCAL US COAST GUARD INSPECTOR ON 2-16-79.				
	6.	FIRE STATION NO. 29 & 30, ADJACENT TO MACHINERY SPACE ENTRANCE ON CAMBER DECK STBD, NOTED TO BE EQUIPED WITH (4) 50'-0" LENGTHS OF 1½" HOSE TO SUIT REQUIREMENTS OF CODE OF FEDERAL REGULATIONS, SECTION 34.17-25.				
	7.	B-V FIRE EXTINGUISHER NO. 15, IN WAY OF HELO LANDING AREA, ALTERED FROM 150# TO 125# TO SUIT INSTALLATION ON SHIP.				
	8.	INDICATION OF HELICOPTER LANDING AREA ON UPPER DECK REVISED TO SUIT U.S. COAST GUARD REQUIREMENTS FOR HELO LANDING AREA AS NOTED IN NEWPORT NEWS CHANGE NO 144 OF 3-2-79.				
	9.	EMERGENCY DIESEL OIL CUTOUT VALVE ADDED FRS 26-27 PORT OUTSIDE OF EMERGENCY DIESEL GENERATOR ROOM ON UPPER DECK TO AGREE WITH DWG NO. 4002-59.				
	10.	DOOR ADDED IN TRANSV BHD FR 23 PORT AT THE 106'-0" LEVEL & VERTICAL LADDER FRS 22-23 PORT BETWEEN TOP OF BOOBY HATCH AND UPPER DECK REPLACED WITH INCLINED LADDER TO FACILITATE ACCESS TO UPTAKE SPACE. (FOR 614C ONLY.)				
	11.	FOAM STATION NO. 30 & 31 (MONITOR) AND FOAM READY SERVICE TANK ADDED IN WAY OF HELICOPTER LANDING AREA TO SUIT US COAST GUARD & CHG NO. 144 OF 3-2-79.				
	12.	RING LIFEBUOYS FRS 64-104 P/S IN WAY OF RAILS RELOCATED INBD TO FIRE STATION HOSE CABINETS TO IMPROVE INSTALLATION OF LIFEBUOYS.	JBC	[illegible]	9-10-79	

AUTHORITY:

GENERAL NOTES:

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS

OWNERS SHELL OIL CO LET NO. 2084V OF 9.7.78	ABS N/A
	USCG MMT LET NO 16710/NNS & DD HULLS 613-614; SER 6062 OF 9-8-78

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPARTMENT
FSCM NO. 43689

NO.	REFERENCES	DWG NO.
14.	DIAG. VENT. HEAT. & AIR COND. EXCLUSIVE OF QUARTERS	2680.579
13.	DIAG. VENT. HEAT. & AIR COND. QUARTERS AREA	2680.580
12.	ARRGT H.P. CO2 SYSTEM IN CARGO PUMP RM	2400-1153
11.	ARRGT H.P. CO2 EQUIP ROOM	2400-1150
10.	ARRGT L.P. CO2 IN MACHY SPACE ABV 78'-4" FLAT	2400-1141
9.	ARRGT L.P. CO2 IN MACHY SPACE 60'-0" TO 78'-4" FLAT	2400-1138
8.	ARRGT L.P. CO2 IN MACHY SPACE ON 33'-0" FLAT	2400-1135
7.	ARRGT L.P. CO2 IN MACHY SPACE BEL 33'-0" FLAT	2400-1132
6.	ARRGT H.P. CO2 EQUIP ROOM	2400-1129
5.	CO2 SYSTEM EMERG GEN RM - ARRGT	2400-1017
4.	CO2 SYSTEM PAINT ROOM - ARRGT	2400-1014
3.	CO2 SYSTEM FIRE PUMP ROOM - ARRGT	2400-1011
2.	DIAG. FOAM SYSTEM - ARRGT	2400-980
1.	DIAG. FIREMAIN SYSTEM - ARRGT	2400-959

SCALE 1/16" = 1 FT
DRAWN JDB & JBC
CHECKED J. D. CORUM, JR
SECT MGR R. Cowley
DATE COMPL. 6-17-76
EXAMINED —
AUTHORIZED F. E. Stephenson
DATE 6-17-76
TECH APPROVAL N/A
CSD APPROVAL R. L. Hennington

390,000 DWT TANKER
FIRE CONTROL PLAN

USMA DESIGN T11-S-116a
HULL NO. 309, 310

DWG NO.	REV	SHEET NO.
0100-777	E	1 OF 1

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS BLUELINE PRINTS FROM AN AUTO-POSITIVE - SEE BELOW ~CHARGE TO 614C-10079~
DATE SIGNED A. Cowley

GROUP: MC NO.

0100. 777
MICRO-MASTER 105 mm
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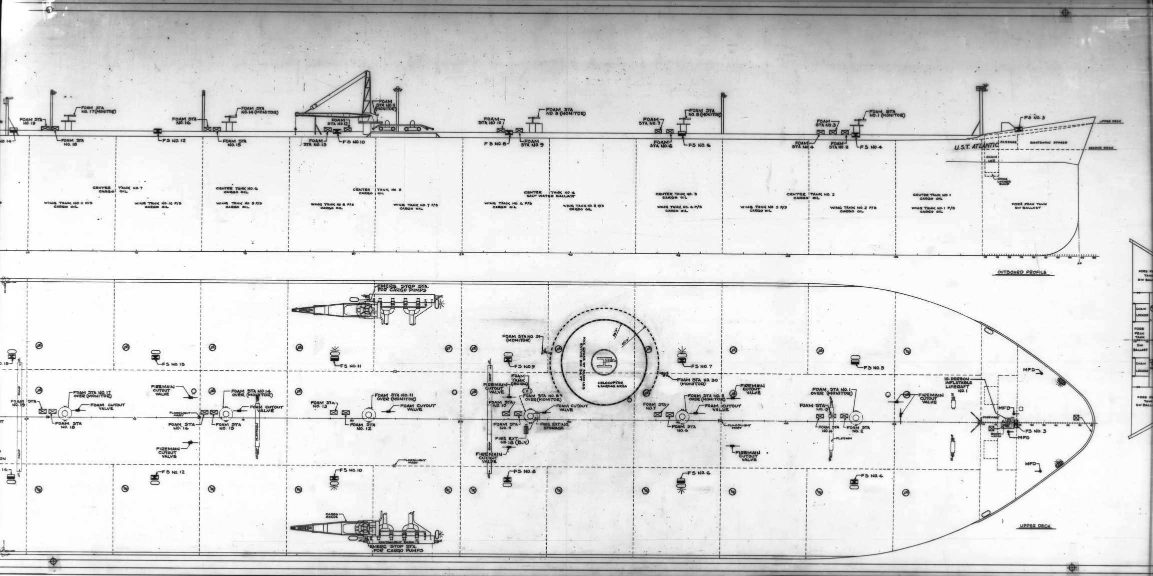
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
10X
FRAME 1


U.S.T. ATLANTIC
OUTBOARD PROFILE
UPPER DECK
SECOND DECK
PASSAGE
BOATSWAIN STORES
CHAIN LKR
CHAIN LOCKER SUMP
FORE PEAK TANK SW BALLAST
CENTER TANK NO. 1 CARGO OIL
WING TANK NO. 1 P/S CARGO OIL
CENTER TANK NO. 2 CARGO OIL
WING TANK NO. 2 P/S CARGO OIL
WING TANK NO. 3 P/S CARGO OIL
CENTER TANK NO. 3 CARGO OIL
WING TANK NO. 4 P/S CARGO OIL
CENTER TANK NO. 4 SALT WATER BALLAST
WING TANK NO. 5 P/S CARGO OIL
WING TANK NO. 6 P/S CARGO OIL
CENTER TANK NO. 5 CARGO OIL
WING TANK NO. 7 P/S CARGO OIL
WING TANK NO. 8 P/S CARGO OIL
CENTER TANK NO. 6 CARGO OIL
WING TANK NO. 9 P/S CARGO OIL
WING TANK NO. 10 P/S CARGO OIL
CENTER TANK NO. 7 CARGO OIL
WING TANK NO. 11 P/S CARGO OIL
FOAM STA NO. 19
FOAM STA NO. 17 (MONITOR)
FOAM STA NO. 18
FOAM STA NO. 16
FOAM STA NO. 14 (MONITOR)
FOAM STA NO. 15
FS NO. 12
FOAM STA NO. 11 (MONITOR)
FOAM STA NO. 12
FOAM STA NO. 13
FS NO. 10
FOAM STA NO. 10
FS NO. 8
FOAM STA NO. 8 (MONITOR)
FOAM STA NO. 9
FOAM STA NO. 7
FOAM STA NO. 5 (MONITOR)
FOAM STA NO. 6
FS NO. 6
FOAM STA NO. 3
FOAM STA NO. 1 (MONITOR)
FOAM STA NO. 4
FOAM STA NO. 2
FS NO. 4
FS NO. 3
FS NO. 14
FS NO. 13
FS NO. 11
FS NO. 9
FS NO. 7
FS NO. 5
EMERG. STOP STA. FOR CARGO PUMPS
CARGO CRANE
CONTAINMENT BASIN
FOAM STA NO. 31 (MONITOR)
FOAM STA NO. 30 (MONITOR)
MAX. GROSS WT 20,000 LBS ROTOR DIA 54 FT
HELICOPTER LANDING AREA
FOAM TANK (150 GAL)
FOAM STA NO. 17 OVER (MONITOR)
FOAM CUTOUT VALVE
FOAM STA NO. 14 OVER (MONITOR)
FOAM STA NO. 11 OVER (MONITOR)
FOAM STA NO. 8 OVER (MONITOR)
FOAM STA NO. 5 OVER (MONITOR)
FOAM STA NO. 1 OVER (MONITOR)
FIREMAIN CUTOUT VALVE
FLOODLIGHT MAST
FIRE EXTING. STORAGE
FIRE EXT. NO. 18 (B.V.)
PLATFORM
RAMP
10-PERSON INFLATABLE LIFERAFT NO. 1
MFD
FOREMAST
BOSUN'S HATCH
CHAIN LOCKER
FORE PEAK TANK SW BALLAST

0100.777

MICRO-MASTER® 105 mm

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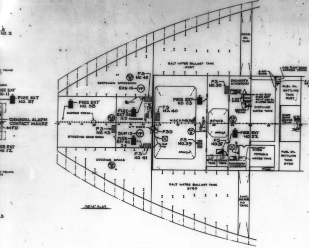
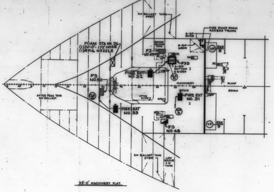
10X

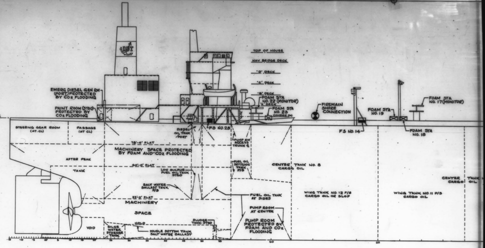
FRAME 2



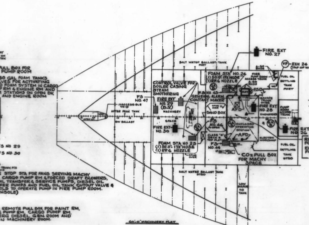
FIRE EXT NO. 37
GENERAL ALARM CONTACT MAKER
SALT WATER BALLAST TANK PORT
BOATSWAIN STOREROOM
FS NO. 42
FIRE EXT NO. 38
FIRE EXT NO. 23
FS NO. 38
ENGINEER'S STOREROOM
DISTILLED WATER TANK
FS NO. 40
FS NO. 43
FS NO. 39
FS NO. 37
FIRE EXT NO. 22
STEERING GEAR ROOM
POTABLE WATER TANK
FUEL OIL SETTLING TANK STBD
FUEL OIL SETTLING TANK PORT
CORDAGE SPACE
FS NO. 41
SALT WATER BALLAST TANK STBD
78'-6" FLAT



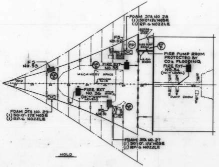
FOAM STA NO. 26 (1) 50'-0"-1½" HOSE (1) RFG NOZZLE
FIRE PUMP ROOM ACCESS TRUNK
FIRE EXT NO. 32
FS NO. 50
FIRE EXT NO. 33
FIRE EXT NO. 31
FS NO. 48
AFTER PEAK TANK SW BALLAST
PUMP ROOM
33'-0" MACHINERY FLAT



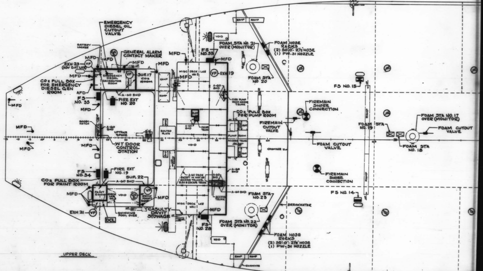
TOP OF HOUSE
NAV BRIDGE DECK
"D" DECK
"C" DECK
"B" DECK
"A" DECK
EMERG DIESEL GEN RM (PORT) PROTECTED BY CO2 FLOODING
PAINT ROOM (STBD) PROTECTED BY CO2 FLOODING
UPPER DECK
FOAM STA NO. 22 (MONITOR)
FOAM STA NO. 23
FIREMAIN SHORE CONNECTION
FOAM STA NO. 19
FOAM STA NO. 17 (MONITOR)
FOAM STA NO. 18
FS NO. 28
FS NO. 14
STEERING GEAR ROOM
PASSAGE
MACHINERY SPACE PROTECTED BY FOAM AND CO2 FLOODING
AFTER PEAK TANK
CENTER TANK NO. 8 CARGO OIL
WING TANK NO. 12 P/S CARGO OIL OR SLOP
WING TANK NO. 11 P/S CARGO OIL
FUEL OIL TANK AT SIDES
PUMP ROOM AT CENTER PROTECTED BY FOAM AND CO2 FLOODING
MACHINERY SPACE
SALT WATER BALLAST TANK P/S
DOUBLE BOTTOM TANK SALT WATER BALLAST
VOID



FIRE EXT NO. 27
EXH 24
SALT WATER BALLAST TANK PORT
FOAM STA NO. 24 (1) 50'-0"-1½" HOSE (1) RFG NOZZLE
CONTROL VALVE FOR BOILER CASING STEAM SMOTHERING
FS NO. 45 GENERAL ALARM CONTACT MAKER
FS NO. 47
FIRE EXT NO. 29
FIRE EXT NO. 28
FIRE EXT NO. 30
FS NO. 46
FS NO. 44
SAND BOX
FOAM STA NO. 25 (1) 50'-0"-1½" HOSE (1) RFG NOZZLE
CO2 PULL BOX FOR MACHY SPACE
FIRE EXT NO. 26
REMOTE CONTROL FOR FIRE PUMPS
EMERG STOP STA. FOR CARGO PUMPS (IN CONSOLE)
SALT WATER BALLAST TANK STBD
60'-0" MACHINERY FLAT



FOAM STA NO. 28 (1) 50'-0"-1½" HOSE (1) RFG NOZZLE
FS NO. 52
FS NO. 53
FIRE EXT NO. 35
FIRE PUMP ROOM PROTECTED BY CO2 FLOODING
FIRE EXT NO. 34
FIRE EXT NO. 36
FS NO. 51
PUMP ROOM
FOAM STA NO. 29 (1) 50'-0" RFG NOZZLE
FOAM STA NO. 27 (1) 50'-0"-1½" HOSE (1) RFG NOZZLE
HOLD



EMERGENCY DIESEL OIL CUTOUT VALVE
GENERAL ALARM CONTACT MAKER
EXH 23
CO2 PULL BOX FOR EMERGENCY DIESEL GEN ROOM
FS NO. 35
FIRE EXT NO. 20
SUP. 17
W.T. DOOR CONTROL STATION
FS NO. 34
FIRE EXT NO. 19
SUP. 22
CO2 PULL BOX FOR PAINT ROOM
EXH 21
CASUALTY DAVIT STOWAGE
FS NO. 33
FOAM STA NO. 21 OVER (MONITOR)
FOAM HOSE RACKS (2) 50'-0"-2½" HOSE (1) PW-31 NOZZLE
FOAM STA NO. 20
CO2 PULL BOX FOR PUMP ROOM
FIREMAIN CUTOUT VALVE
FIREMAIN SHORE CONNECTION
FS NO. 15
FOAM STA NO. 19
FOAM STA NO. 17 OVER (MONITOR)
FOAM CUTOUT VALVE
FOAM STA NO. 18
FOAM STA NO. 23
FOAM STA NO. 22 OVER (MONITOR)
FS NO. 26
FS NO. 14
BREAKWATER
MFD
UPPER DECK

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MICRO-MASTER 105 mm
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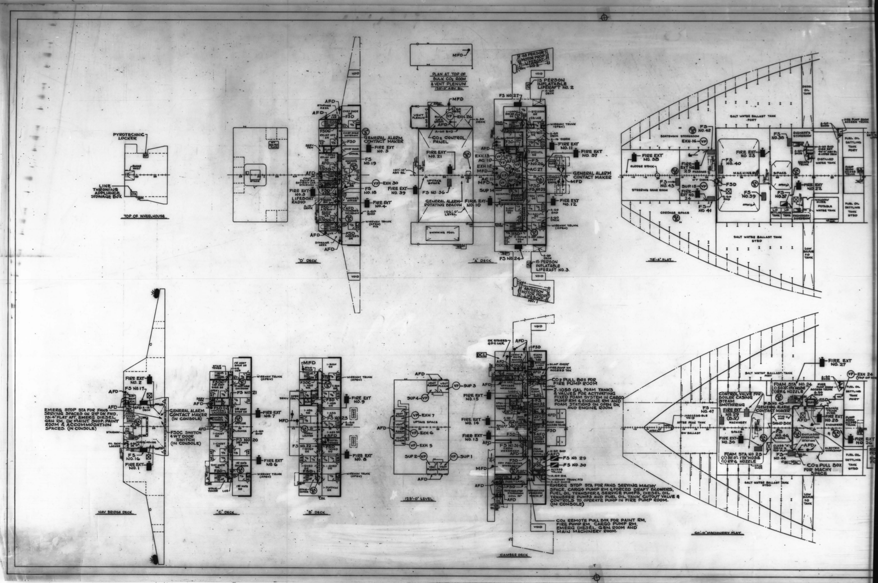
SEPT. '80
10X
FRAME 3


TOP OF WHEELHOUSE
PYROTECHNIC LOCKER
LINE THROWING APPLIANCE STOWAGE BOX
'D' DECK
PLAN AT TOP OF BULK CO2 ROOM & VENT PLENUM
CO2 CONTROL PANEL
GENERAL ALARM CONTACT MAKER
GENERAL ALARM ROTATING BEACON
FIRE EXT NO. 3
FIRE EXT NO. 4
FIRE EXT NO. 5
FS NO. 18
FS NO. 19
LIFEBOAT RADIO
FIRE EXT NO. 21
FIRE EXT NO. 39
FS NO. 36
FIRE EXT NO. 10
'A' DECK
15 PERSON INFLATABLE LIFERAFT NO. 2
15 PERSON INFLATABLE LIFERAFT NO. 3
48 PERSON MOTOR PROPELLED LIFEBOAT NO. 1
48 PERSON MOTOR PROPELLED LIFEBOAT NO. 2
FS NO. 27
FS NO. 24
FIRE EXT NO. 11
FIRE EXT NO. 12
FIRE EXT NO. 37
78'-4" FLAT
SALT WATER BALLAST TANK PORT
SALT WATER BALLAST TANK STBD
STEERING GEAR ROOM
CORDAGE SPACE
BOATSWAIN STOREROOM
MACHINERY SPACE
FIRE EXT NO. 38
FIRE EXT NO. 25
FIRE EXT NO. 24
FIRE EXT NO. 23
FIRE EXT NO. 22
FS NO. 40
FS NO. 41
FS NO. 42
FS NO. 43
FUEL OIL SETTLING TANK PORT
FUEL OIL SETTLING TANK STBD
DISTILLED WATER TANK
POTABLE WATER TANK
NAV BRIDGE DECK
FIRE EXT NO. 2
FS NO. 17
FS NO. 16
FIRE EXT NO. 1
EMERG STOP STA FOR FANS SERVING SPACES ON 2ND DK FWD, 78'-4" FLAT AFT, EMERG DIESEL GEN RM, DK MAINT. SHOP, PAINT ROOM & ACCOMMODATION SPACES. (IN CONSOLE)
GENERAL ALARM CONTACT MAKER (IN CONSOLE)
FSDC SWITCH 4 WT DOOR SWITCH (IN CONSOLE)
'C' DECK
FIRE EXT NO. 6
FIRE EXT NO. 7
FS NO. 20
FS NO. 21
'B' DECK
FIRE EXT NO. 8
FIRE EXT NO. 9
FS NO. 22
FS NO. 23
123'-0" LEVEL
UPTAKE SPACE
CAMBER DECK
FIRE EXT NO. 15
FIRE EXT NO. 14
FIRE EXT NO. 13
FS NO. 31
FS NO. 32
FS NO. 29
FS NO. 30
CO2 PULL BOX FOR FIRE PUMP ROOM
2-1050 GAL FOAM TANKS & VALVES FOR ACTIVATING FIXED FOAM SYSTEM IN CARGO PUMP RM & ENGINE RM AND FOAM STATIONS ON OPEN DK AND ENGINE ROOM
EMERG STOP STA FOR FANS SERVING MACHY SPACE, CARGO PUMP RM & FORCED DRAFT BLOWERS, FUEL OIL TRANSFER & SERVICE PUMPS, DIESEL OIL TRANSFER PUMPS AND FUEL OIL TANK CUTOUT VALVE & CONTROLS TO OPERATE PUMP IN FIRE PUMP ROOM. (IN CONSOLE)
CO2 REMOTE PULL BOX FOR PAINT RM, FIRE PUMP RM, CARGO PUMP RM, EMERG DIESEL GEN ROOM AND MAIN MACHINERY ROOM.
60'-0" MACHINERY FLAT
AFTER PEAK TANK
INACCESSIBLE VOID
SW BALLAST
CONTROL VALVE FOR BOILER CASING STEAM SMOTHERING
FIRE EXT NO. 29
FIRE EXT NO. 30
FIRE EXT NO. 27
FIRE EXT NO. 28
FS NO. 47
FS NO. 44
FS NO. 45
FS NO. 46
FOAM STA NO. 24
FOAM STA NO. 25
FOAM STA NO. 26
GENERAL ALARM CONTACT MAKER
CO2 PULL BOX FOR MACHY SPACE
SAND BOX
ELECTRIC WORKSHOP

0100.777

MICRO-MASTER 105 mm

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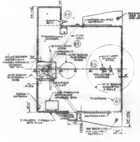
SEPT. '80

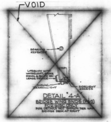
10X

FRAME 4


FR 50
26'-0½"
E3
CHAIN RAIL
VL
PYROTECHNIC LOCKER
PIPE STAY
VHF (MR-106-37A) ANTENNA
FACSIMILE RECEIVING / RDF SENSE (MR-106-12A) ANTENNA
E2
SIGNAL YARD OVER
MANHOLE OVER
3CM RADAR PLATFORM OVER
RDF LOOP ANTENNA OVER
E1
15"x23" RAISED WATERTIGHT HINGED MANHOLE DOGGED 24" SILL
24"
10CM RADAR PLATFORM OVER
PROJECTOR COMPASS
15"
RADAR MAST
10'-0" RADIUS MAGNETIC CIRCLE
VL OVER
OMEGA ANTENNA
LINE THROWING APPLIANCE STORAGE BOX
TV ANTENNA
15'-0"
DN 30°L
NAMEBOARD
24'-0¼"
2 COURSE PIPERAIL 39½" HIGH
72"
FR 58
AM RECEIVING (MR-106-17A) ANTENNA
39"

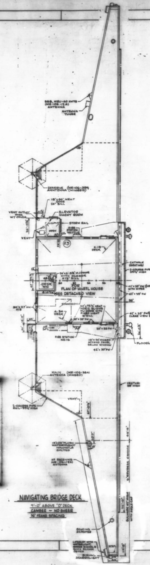
TOP OF WHEEL HOUSE

8'-9" ABOVE NAVIGATING BRIDGE DECK
AT FWD END ~ 3' STRAIGHT LINE
SHEER AFT ~ NO CAMBER
36" FRAME SPACING


VOID
BEARING REPEATER
STEP
LIFEBUOY WITH WATERLIGHT, SMOKE SIGNAL & QUICK RELEASE DEVICE
SIGNAL SEARCHLIGHT
SIDELIGHT RECESS

DETAIL "4-A"

BRIDGE WING ENDS (P&S)
FOR G15C ONLY
FOR DETAILS NOT SHOWN SEE NAV BRIDGE DECK AT RIGHT


SSB, MRU-40 XMTG (MR-106-12A) ANTENNA
ANTENNA TUNER
RESERVE (MR-106-38A) ANNTENNA (HINGED)
18"x56" WEAT DOOR 24" SILL
VENT OUTLET OVER WT COVER
ELEVATOR MACHY ROOM
STORM RAIL
FIRE STATION NO.17
OPEN
VENT
26'-0¼"
FR 50
E3
A-15 DECK
CATWALK (GRATING)
2-COURSE PIPE RAIL 39½" HIGH
26"x6'-2½" MJ DOOR WITH CLOSER 3½" SILL
DECK WC
FOR PLAN OF WHEEL HOUSE SEE DETACHED VIEW
42"x35" FW (HEATED) WITH WIPER
42"x35" FW
30"x27" HW P/S
STANCHION
30"x72½" WEAT HORIZ SLIDING MJ DOOR WITH FIXED LIGHT 6" SILL
A-30 DECK
30"x35" FW
42"x35" FW (HEATED) WITH CLEAR VIEW SCREEN P/S
UP 30°L
FIRE STATION NO.16
18"x24" HINGED ACCESS PANEL BELOW WINDOW
42"x30" FW
FLOODLIGHTS
MAIN (MR-106-38A) ANTENNA (HINGED)
VENTURI 56" HIGH
VENT
2-COURSE PIPE RAIL - 39½" HIGH
15"x23" FLUSH WATERTIGHT MANHOLE BOLTED
HF RECEIVING (MR-106-12A) ANTENNA
6" REVERSE CAMBER
BULWARK 42" HIGH WITH ANGLE CAP
BEARING REPEATER
LIFEBUOY WITH WATERLIGHT, SMOKE SIGNAL & QUICK RELEASE DEVICE
STEP
SIGNAL SEARCHLIGHT

NAVIGATING BRIDGE DECK

9'-0" ABOVE "D" DECK
CAMBER ~ NO SHEER
36" FRAME SPACING

ABBREVIATIONS

DN......DOWN
FR......FRAME
FW......FIXED WINDOW
HORIZ....HORIZONTAL
HW......HINGED WINDOW
IL......INCLINED LADDER
LAV.....LAVATORY
M&SO....MIRROR & SHELF OVER
MACHY....MACHINERY
MJ......METAL JOINER
VL......VERTICAL LADDER
WB......WASTE BASKET
WC......WATER CLOSET
WEAT....WEATHER TIGHT

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH'D	OWNER DATE	OWNER APP'D
A	1	INITIAL ISSUE.			☒	☒
B	2-A' 3-D'	1. EXTENT OF VENTURI ON NAV BR WING REVISED FROM 80'-0" TO 91'-0" OFF CL P/S TO SUIT REQUEST OF OWNER AS NOTED IN THEIR LETTER & SKETCH DATED 1-29-76.				
	3-A' 3-D'	2. BEARING REPEATER ON NAV BR WING RELOCATED INBD TO ABOUT 101'-0" OFF CL P/S TO PROVIDE WORKING CLEARANCE IN WAY OF UNIT.				
	GEN	3. CONFIGURATION & ARRANGEMENT OF WHEELHOUSE REVISED TO SUIT OWNERS (SHELL) LETTER & SKETCH DATED 2-11-76 (AS DISCUSSED WITH OWNERS (SHELL) REPRESENTATIVE ON 6-3-76. PLATFORMS, INCLINED LADDERS, RAILS & STANCHIONS, ELEVATOR MACHINERY ROOM & ANTENNA ARRANGEMENT REVISED TO SUIT.				
	3-A'	4. REVERSE CAMBER NOTED IN WAY OF NAV BR WINGS OUTBD OF 57'-1¼" OFF CL P/S TO SUIT DWG NO. 1270-582				
	5-B'	5. CAMBER NOTED IN WAY OF WHEELHOUSE TOP TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 1270-583				
	5-B'	6. CONFIGURATION OF RADAR MAST REVISED TO SUIT DESIGN DEVELOPMENT OF FREE STANDING MAST				
	3-A' 4-A'	7. AUXILIARY VIEW OF NAV BRIDGE WING ADDED IN PANEL 4-A FOR G15C ONLY TO SUIT CHANGE NO. 64, SUPT NO. 1 OF 6-22-76.	EP 11/4/76 G.	AC	☒	☒
C	GEN.	1. ANTENNAS THRUOUT REVISED & RELOCATED TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO 4000-1056.				
	4C'	2. NAV BR DK: ACCESS DOOR TO ELEVATOR MACHY ROOM RELOCATED FROM 36" TO 37½" FWD OF AFT BHD & DOOR ALTERED FROM 24"x56" TO 18"x56" TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 1270-643.				
	6A' 6C'	3. NAV BR DK: ACCESS DOOR TO WHEELHOUSE RELOCATED FROM 72" TO 6'-10½" AFT OF FR 58 FOR G13 & G14C AND 66½" AFT OF FR 58 FOR G15C TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 5250-64 & 5250-79 RESPECTIVELY.				
	5B'	4. NAV BR DK: ACCESS DOOR TO WHEELHOUSE ALTERED FROM 30"x69½"x 9" SILL TO 30"x72½"x6" SILL TO SUIT DEVELOPMENT AS INDICATED ON DWG NO 5250-79.				
	3A' 3B'	5. NAV BR DK: RING LIFEBUOY RELOCATED FROM OUTBD TO AFT SIDE OF NAV BR WING P/S TO AGREE WITH DWG NO 8000-94.				
	3A' 3B'	6. NAV BR DK: MANHOLE ADDED FR 54 AT 67'-7" OFF CL P/S TO IMPROVE ACCESS TO VOID SPACE BELOW.				
	3A' 4C'	7. NAV BR DK: EXTENT OF REVERSE CAMBER ON NAV BR WING P/S REVISED & ACCESS PLATFORM FRS 46-47 STBD RELOC. TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 1270-582.				
	5B'	8. NAV BR DK: HEATED WINDOWS IN WHEELHOUSE FRONT NOTED TO SUIT SHELL LETTER NO. 1115V OF 10-4-76.				
	4B'	9. NAV BR DK: HINGED WINDOWS IN AFT BHD OF WHEELHOUSE ALTERED FROM 30"x33" TO 30"x27" TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 5200-77.				
	5B' 5C'	10. NAV BR DK: DECK IN WAY OF WHEELHOUSE NOTED "CLASS A-15 DECK" EXCEPT DECK IN WAY OF RADIO ROOM BELOW NOTED TO BE CLASS A-30 DECK TO SUIT USCG REQUIREMENTS FOR FIRE PROTECTION.				
	3A' 3B'	11. NAV BR DK: SIGNAL SEARCHLIGHT & STEP IN WAY OF SAME ADDED AT END OF NAV BR WING P/S TO SUIT DESIGN DEVELOPMENT & AS INDICATED ON DWG NO. 3701-154.				
	5B2	12. TOP OF WHEELHOUSE: HOUSE TOP PLATING FRS 161-154 STBD IN WAY OF ACCESS LADDER REVISED & 3" STRAIGHT LINE SHEER ADDED IN HOUSE TOP TO IMPROVE DRAINAGE AND AS INDICATED ON DWG NO 1270-583.				
	4C'	13. TOP OF WHEELHOUSE: PROJECTOR COMPASS FOR G15C RELOCATED FROM ABOUT 42" TO ABOUT 7'-3" AFT OF FR 58 TO SUIT DEVELOPMENT OF WHEELHOUSE ARRANGEMENT BELOW.				
	5B'	14. TOP OF WHEELHOUSE: RADAR MAST REVISED, MANHOLE IN MAST RELOCATED FROM 20" TO 24" FWD OF AFT SIDE OF MAST & INDICATION OF RADAR PLATFORMS AND SIGNAL YARD OVER MODIFIED. ALL TO SUIT DESIGN DEVELOPMENT OF MAST AS INDICATED ON DWG NO. 3202-135 & 3202-136.				
	5C'	15. TOP OF WHEELHOUSE: VERTICAL LADDER ACCESS TO RADAR MAST BELOW THE 3CM RADAR PLATFORM RELOCATED FROM OUTSIDE TO INSIDE OF MAST. MANHOLE ADDED IN FWD SIDE OF MAST JUST ABOVE THE 3CM RADAR PLATFORM AND MANHOLE IN PORT SIDE OF MAST ALTERED FROM BOLTED TO DOGGED MANHOLE. ALL TO IMPROVE ACCESS IN WAY OF RADAR MAST.				
	4B'	16. NAV BR DK: FWD BHD OF DECK WC RELOCATED FROM 7'10" TO 8'10¾" FWD OF AFT END OF HOUSE TO AGREE WITH DWG NO 1270-647.				
	4C'	17. NAV BR DK: INTERIOR STORM RAILS IN WHEELHOUSE REVISED TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 5100-13.				
	6A' 6C'	18. NAV BR DK: MJ DOOR TO OIL SKIN LKR & DECK WC ALTERED FROM 26"x6'-3½"x3" SILL TO 26"x6'-2½"x4" SILL TO SUIT DESIGN DEVELOPMENT OF DOOR AS INDICATED ON DWG NO. 5250-68.				
	6A'	19. NAV BR DK: ARRANGEMENT OF WHEELHOUSE REVISED AND BELL LOGGER ADDED TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 4300-2448.				
	6C'	20. NAV BR DK: AUXILIARY VIEW OF WHEELHOUSE ARRANGEMENT ADDED IN PANEL 6-C FOR G15C ONLY TO SUIT NN CHANGE No. 354100 AND DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 4300-2449.	JBC		4-4-78	LET NO 2124V OF 6-29-78
D	3D' 3C'	1. NAV BR DK: VENT ADDED FRS 52-53 ABOUT 55'-0" OFF CL P/S TO SUIT NN CHANGE NO. 129 OF 2-17-78 AND AS INDICATED ON DWG NO 2080-598.				
	4C'	2. NAV BR DK: VENTS ADDED FRS 47-48 PORT IN WAY OF ELEVATOR MACHINERY ROOM TO SUIT DESIGN DEVELOPMENT OF VENTILATION AS INDICATED ON DWG NO. 2080-600.				
	3B' 3C'	3. NAV BR DK: FLOODLIGHTS ADDED ON WALKWAY AT WHEELHOUSE FRONT P/S TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 3202-134.				
	5C'	4. TOP OF HOUSE: SIZE OF PYROTECHNIC LOCKER FRS 51-52 PORT REVISED TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 7700-553.				
	6A'	5. PLAN VIEW OF WHEELHOUSE: INDICATION OF POWER PANEL FR 53 ABOUT 60" OFF ℄ STBD DELETED TO AGREE WITH DWG NO. 4300-2448.	JBC		11-8-78	LET NO 2168V OF 12-22-78
E	5C'	1. TOP OF WHEELHOUSE: RDF LOOP ANTENNA RELOCATED FROM FR 53 TO ABOUT FR 50 ℄ TO IMPROVE EFFICIENCY OF SYSTEM.				
	5C'	2. TOP OF WHEELHOUSE: PIPE STAYS ADDED IN WAY OF RADAR MAST TO SUIT DESIGN DEVELOPMENT. PYROTECHNIC LOCKER IN WAY OF SAME RELOCATED FURTHER AFT TO SUIT.				
	3C' 5C'	3. NAV BR DK: VERTICAL LADDER ADDED FRS 50-51 PORT ON FWD BHD OF ELEVATOR MACHINERY ROOM TO IMPROVE ACCESS. RAILS IN WAY OF HOUSE TOP REVISED TO SUIT.				
	GEN'	4. INCLINED LADDERS THRUOUT ALTERED FROM 24" TO 30" WIDE TO AGREE WITH DWG NO. 3300-186.				
		5. ALL REFERENCE TO G15C ON PLAN NOTED VOID.	JBC			

AUTHORITY:

GENERAL NOTES:

1. SILL HEIGHT FOR ALL DOORS ARE TAKEN AT CL OF DOOR & ABOVE STEEL DECK.

NNS&DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
~~G15C~~	~~311~~	
G14C	310	
G13C	309	

APPROVALS

OWNERS SHELL LET NO. 1115V OF 10-4-76
ZAPATA LET OF 8-27-76
USPH LETTER OF 2-10-76
USCG LETTER NO. 9140/NN5600 HULLS G13-G15 OF 4-13-76

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPARTMENT
FSCM NO. 43689

KEY PLAN

HULL APPLICABILITY	NO.	REFERENCES	DWG NO.
G13C, G14C	14	UPPER DECK AFT OF FR 81 ~ GENERAL ARRANGEMENT	0100-909
G13C, G14C	13	UPPER DECK FWD OF FR 81 ~ GENERAL ARRANGEMENT	0100-908
G13C, G14C	12	SECOND DECK FWD & 78'-4" FLAT AFT ~ GEN'L ARRGT	0100-917
~~G15C~~	~~11~~	~~30'-0" & 60'-0" FLAT AFT ~ GENERAL ARRANGEMENT~~	~~0100-951~~
G13C, G14C	10	HOLD AFT OF FR 81 ~ GENERAL ARRANGEMENT	0100-920
G13C, G14C	9	HOLD FWD OF FR 81 ~ GENERAL ARRANGEMENT	0100-919
G13C, G14C, ~~G15C~~	8	NAV BRIDGE & HOUSE TOP - GENERAL ARRANGEMENT	0100-778
G13C, G14C, ~~G15C~~	7	ACCOMMODATIONS - GEN'L ARRGT IN DECK HOUSE	0100-774
~~G15C~~	~~6~~	~~UPPER DK AFT OF FR 81 - GENERAL ARRANGEMENT~~	~~0100-773~~
~~G15C~~	~~5~~	~~UPPER DK FWD OF FR 81 - GENERAL ARRANGEMENT~~	~~0100-772~~
~~G15C~~	~~4~~	~~SECOND DK FWD & 78'-4" FLAT AFT - GENERAL ARRANGEMENT~~	~~0100-771~~
G13C, G14C	3	33'-0" & 60'-0" FLAT AFT - GENERAL ARRANGEMENT	0100-770
~~G15C~~	~~2~~	~~HOLD AFT OF FR 81 ~ GENERAL ARRANGEMENT~~	~~0100-769~~
~~G15C~~	~~1~~	~~HOLD FWD OF FR 81 ~ GENERAL ARRANGEMENT~~	~~0100-768~~

SCALE ⅛ & AS NOTED = 1 FT
DRAWN J. D. BENTON, JR.
CHECKED J. B. CORUM, JR.
SECT MGR R. Cowling
DATE COMPL 1-22-76
EXAMINED
AUTHORIZED E. F. Stephenson
DATE 1-22-76
TECH APPROVAL RM Shea 1/22/76
CSD APPROVAL R. L. Harrington

390,000 DWT TANKER
NAVIGATING BRIDGE & HOUSE TOP
GENERAL ARRANGEMENT

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO. 309, 310 & 311
DWG NO. 0100-778
REV E
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS BLUELINE PRINTS FROM AN AUTO-POSITIVE. CHARGE TO G14C-10079.
DATE MC Mar SIGNED MC Mar
YARD PRINTS
ORDERED BY DESIGN
DEPT.
SPECIAL PRINTS
GROUP:
MC NO.

0100-778

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 1

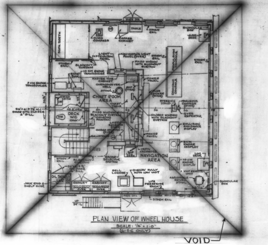


CHART ROOM AREA
NAVIGATION AREA
DECK WC
VOID

PLAN VIEW OF WHEEL HOUSE
SCALE: 1/4" = 1'-0"
(615C ONLY)

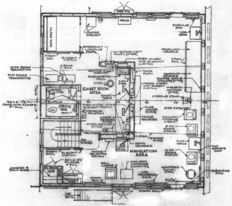
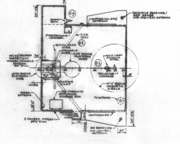
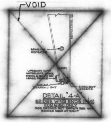


CHART ROOM AREA
NAVIGATION AREA
DECK WC

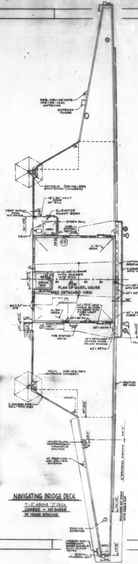
PLAN VIEW OF WHEEL HOUSE
SCALE: 1/4" = 1'-0"


RADAR MAST
TV ANTENNA

TOP OF WHEEL HOUSE
8'-9" ABOVE NAVIGATING BRIDGE DECK
AT FWD END — 3" STRAIGHT LINE
SHEER AFT — NO CAMBER
36" FRAME SPACING



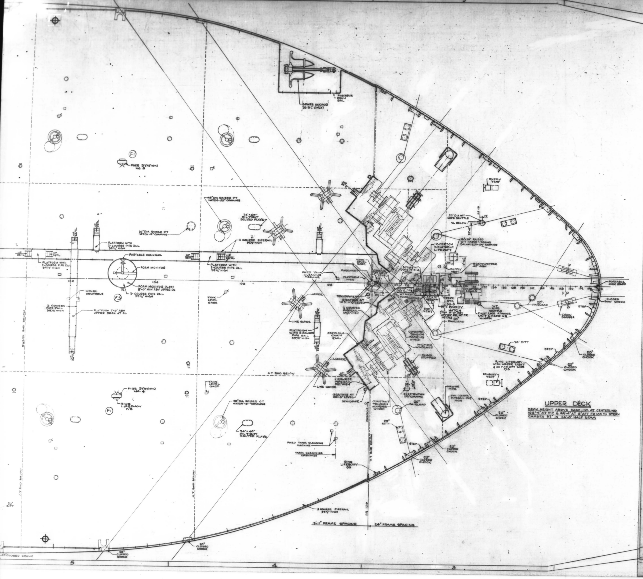
DETAIL "4-A"
BRIDGE WING ENCL (P&S)


FOR PLAN OF WHEEL HOUSE SEE DETACHED VIEW
FLOODLIGHTS

NAVIGATING BRIDGE DECK
7'-0" ABOVE "D" DECK
CAMBER — NO SHEER
36" FRAME SPACING

ABBREVIATI

0100-778
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 2


SPARE ANCHOR (G13C ONLY)
PORTABLE CHAIN RAIL
FIRE STATION NO. 5
F1
48" DIA RAISED OT HATCH-30" COAMING
24"x48" OIL TIGHT BOLTED PLATE
36" DIA RAISED OT HATCH-9" COAMING
PLATFORM WITH 2-COURSE PIPE RAIL 39½" HIGH
2 COURSE PIPERAIL 39½" HIGH
PORTABLE CHAIN RAIL
FOAM MONITOR
FOAM MONITOR PLATF 8'-0" MIN ABV UPPER DK
2-COURSE PIPE RAIL 39½" HIGH
F3
WINCH CONTROLS
2-COURSE PIPE RAIL 39½" HIGH
PLATFORM 7'-0" ABV UPPER DECK AT CL
SWASH BHD BELOW
TANK LEVEL GAGE
FIXED TANK CLEANING MACHINE
FOREMAST
PLATFORM OVER
LADDER
STANDPIPE
GRATING AT 103'-0" LEVEL
LINE GUIDE
PORTABLE CHAIN RAIL
OT BHD BELOW
FIRE STATION NO. 4
RING LIFEBUOY P/S
48" DIA RAISED OT HATCH-30" COAMING
GRATING AT 102'-3" LEVEL
TANK CLEANING OPENINGS
RING LIFEBUOY P/S
SUPPLY VENT
20" DIA WT ROPE SCUTTLE
VL BELOW
36"x36" RAISED WT HATCH-(SPRING BALANCED)-24" COAMING
10-PERSON INFLATABLE LIFERAFT
BREAKWATER 42" HIGH
30"x60" WT DOOR-24" SILL
SHIPS BELL
FIRE STA NO. 3
WT BOOBY HATCH (TOP 7'-0" ABV UPPER DK AT FR 117½)
EXH VENT
WT ROPE SCUTTLE
FIRST LINE ASHORE UNIT & MOORING WINCH
20" FAIRLEAD
CONSTANT TENSION MOORING WINCH
ANCHOR WINDLASS
CHAIN STOPPER
PORTABLE JACK STAFF
CLOSED BOW CHOCK
STEP
F.P.
20" BITT
20" CLOSED CHOCK
RING LIFEBUOY WITH WATER LIGHT & 20 FATHOM LINE P/S
EXHAUST VENT
HAWSE PIPE
TWO COURSE PIPERAIL-39½" HIGH
15"x23" RWTMH 2½" COAMING
KNUCKLE
OT BHD BELOW
102
104
106
108
17'-11" FRAME SPACING
24' FRAME SPACING

UPPER DECK

DECK HEIGHT ABOVE BASELINE AT CENTERLINE: 108'-4" AT F.P. & 99'-4" AT 6" AFT FR 109 TO STERN

CAMBER 52" IN 114'-0" HALF BEAM

ABBREVIATIONS

ABV - ABOVE
AO - ACCESS OPENING
BHD - BULKHEAD
BL - BASELINE
CL - CENTERLINE
DIA - DIAMETER
DK - DECK
DN - DOWN
FP - FORWARD PERPENDICULAR
FR - FRAME
IL - INCLINED LADDER
MIN - MINIMUM
NO. - NUMBER
OT - OIL TIGHT
PLATF - PLATFORM
RWTMH - RAISED WATERTIGHT MANHOLE HINGED
VL - VERTICAL LADDER
WT - WATERTIGHT
LR - LADDER RUNGS

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHO	OWNER DATE	OWNER APPD
A		INITIAL ISSUE				
B	4-C' 5-C'	1. SPARE ANCHOR RELOCATED FROM FRS 95-96 PORT TO FRS 104-106 PORT TO SUIT OWNERS REQUEST IN THEIR LETTER DATED 1-29-76.				
	3-C'	2. HATCH FRS 124-126 PORT RELOCATED TO 11'-6" OFF CL PORT & 3'-9" FWD OF FR 124 TO CLEAR STIFFENERS ON TRANSV BHD 124 BELOW.				
	3-B'	3. MANHOLE FRS 114-116 AT 18' OFF CL STBD DELETED AS NOT REQUIRED FOR ACCESS.				
	4-C' 4-D'	4. EXTENT OF BULWARK FRS 108-109 P/S REVISED TO SUIT DESIGN DEVELOPMENT.				
	GEN.	5. MOORING ARRANGEMENT THRUOUT REVISED SLIGHTLY. UNIVERSAL CHOCKS ALTERED TO CLOSED CHOCKS & ROLLER IN WAY OF MOORING LINE GUIDES ALTERED TO CURVED PLATES. ALL TO SUIT DEVELOPMENT OF MOORING ARRANGEMENT AS SHOWN ON DWG NO. 1203-51 & CHANGE NO. 72 OF 3-29-76.				
	GEN.	6. RING LIFEBUOYS ADDED THRUOUT SHIP TO SUIT U.S. COAST GUARD REQUIREMENTS.				
	7-C' 7-D' 8-C'	7. HELICOPTER LANDING AREA INDICATED FRS 89-94 PORT. 36" DIA RAISED OT HATCH FRS 91-93 RELOCATED FROM 21'-6" TO 19'-6" OFF CL PORT & REHINGED FROM INBD TO OUTBD. 48" DIA RAISED OT HATCH FRS 93-94 AT 58'-6" OFF CL PORT RELOCATED FROM 10'-0" TO 11'-9" FWD OF FRAME 93. FIXED TANK CLEANING MACHINE FRS 91-93 RELOCATED FROM 79'-6" TO 82'-6" OFF CL PORT. ALL TO SUIT CHANGE NO. 19 OF 4-28-76.				
	4-B' 4-C'	8. RAISED GRATINGS ADD IN WAY OF ANCHOR WINDLASS AND MOORING WINCHES FRS 106-122 P/S TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 3300-197	EP C.	5/4/76	AC	LET. 1004V OF 7-28-76
C	3C'	1. 20" DIA ROPE SCUTTLE & VL BELOW ADDED FRS 151-152 AT 25'-6" OFF CL PORT. (INADVERTENTLY DELETED).				
	4C'	2. SPARE ANCHOR RELOCATED FROM FRS 104-106 AT 50'-0⅛" OFF CL PORT TO FRS 107-108 PORT ADJACENT TO SHELL TO SUIT OWNER'S REQUEST ON DWG NO. 7700-616.				
	[illegible]	3. STEPS ADDED AT SHELL FWD OF FR 116 P/S IN WAY OF MOORING CHOCKS TO SUIT OWNER'S REQUEST.				
	[illegible]	4. FOAM MONITOR PLATFORMS REVISED & RELOCATED THROUGHOUT TO SUIT STRUCTURAL DEVELOPMENT & DESIGN DEVELOPMENT OF FOAM SYSTEM.				
	4A' 4C'	5. FIXED TANK CLEANING MACHINE 61'-6" OFF CL P/S RELOCATED FROM 30" AFT TO 24" FWD OF FR 108 TO SUIT STRUCTURAL DEVELOPMENT OF WEBS BELOW.				
	GEN	6. TANK CLEANING OPENINGS MODIFIED THROUGHOUT CARGO AREA AS DISCUSSED WITH OWNERS AND AUTHORIZED BY COST ENGINEERS LETTER OF 6-16-76.				
	[illegible]	7. CHAIN STOPPER FRS 116-120 P/S ALTERED FROM SINGLE SHEAR TO DOUBLE SHEAR TYPE TO SUIT CHANGE ORDER NO. 96 OF 10-15-76.				
	10C' 10D'	8. NUMBER & LOCATION OF CRUCIFORM BITTS, CLOSED CHOCKS & DECK PADS IN WAY OF CARGO MANIFOLD FRS 81-85 P/S REVISED TO SUIT CHANGE ORDER NO. 87 OF 2-9-77.				
	9C' 4C'	9. FUEL OIL & DIESEL OIL HEADERS FRS 81-85 P/S RELOCATED SLIGHTLY TO SUIT DEVELOPMENT OF CARGO MANIFOLD. WALKWAY, DRIP PAN & HOSE SADDLE IN WAY OF SAME MODIFIED TO SUIT.				
	6C'	10. VERTICAL LADDER IN WAY OF MOORING LINE GUIDES FRS 96-100 RELOCATED FROM INBD TO OUTBD SIDE OF LINE GUIDE TO IMPROVE ACCESS TO SAME.				
	[illegible]	11. BULWARK CAP RAIL FWD OF FR 109 P/S REVISED & BRACKETS ADDED IN WAY OF BULWARK TO SUIT DWG NO. 1000-200.				
	[illegible]	12. HAWSE PIPE FRS 122-126 P/S REVISED TO SUIT DESIGN DEVELOPMENT OF ANCHOR HANDLING ARRANGEMENT.				
	4B' 4C'	13. VERTICAL LADDER ABOUT FR 108½ P/S IN WAY OF WINCH OPERATORS PLATFORM ALTERED TO 24" INCLINED LADDER TO SUIT OWNERS LETTER OF 7-28-76.				
	5C' 6B' 6C'	14. INDICATION OF MOORING WINCH FRS 96-98 STBD & FRS 99-100 PORT REVISED & OPERATORS PLATFORM ADDED IN WAY OF SAME AND PLATFORMS ADDED IN WAY OF WINCH FRS 126-132 CL TO SUIT DWG NO. 1203-51.				
	9B'	15. TRANSV RAMP & PLATFORM ADDED FRS 86-87 P/S TO FACILITATE HANDLING OF TANK CLEANING & GAS FREEING EQUIPMENT ON OPEN DECK.				
	GEN	16. PLATFORM & INCLINED LADDERS ADDED THROUGHOUT IN WAY OF DECK PIPING TO FACILITATE ACCESS & HANDLING OF EQUIPMENT IN WAY OF PIPING.				
	6B'	17. WINCH CONTROL PLATFORM FRS 98-99 PORT DELETED AND WINCH CONTROLS ADDED ON PLATFORM FRS 102-103 STBD TO IMPROVE ARRANGEMENT.				
	2B' 3C'	18. 20" FAIRLEADER FR 136 ABOUT 22'-6" OFF CL P/S DELETED & 20" BITT FRS 140-142 RELOCATED TO FRS 156-159 P/S TO SUIT DEVELOPMENT OF MOORING ARRGT AS INDICATED ON DWG NO. 1203-51.	JB C.	[illegible]	AC.	LET. NO. 1653V OF 5-11-77
D	3C'	1. STAYS ADDED ON FOREMAST FR 109 CL AND INDICATION OF PLATFORM OVER ADDED IN WAY OF SAME TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 3202-137.				
	GEN.	2. RAMP FRS 86-87, CROSSWALK FRS 102-103 AND PLATFORMS OVER DECK PIPING IN WAY OF FORE & AFT WALKWAY REVISED & RELOCATED TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 3300-221. INDICATION OF INCLINED LADDERS IN WAY OF PLATFORMS REVISED TO SUIT.				
	8C'	3. FIRE EXTINGUISHER STORAGE ROOM ADDED FRS 88-89 PORT ADJACENT TO CL TO PROVIDE STORAGE SPACE FOR SEMIPORTABLE DRY CHEMICAL FIRE EXTINGUISHER FOR HELO LANDING AREA AS REQUIRED BY US COAST GUARD AND NOTED IN THEIR LETTER 16710/NNS & DD HULLS 613-615; SER 4091 OF APRIL 19, 1977. THIS IS PART OF N.N CHG NO 19.				
	3C'	4. SHIPS BELL ADDED FR 110 CL TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 8000-70.				
	GEN.	5. FIRE STATIONS ADDED THRUOUT TO SUIT DESIGN DEVELOPMENT OF FIREMAIN SYSTEM AS INDICATED ON DWG NO. 2400-959.				
	GEN	6. TANK LEVEL GAGES & STANDPIPES ADDED THRUOUT TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 2730-343. LADDER RUNGS ADDED ON STANDPIPES TO PROVIDE ACCESS TO HINGED COVER ON TOP OF STANDPIPE.				
	3C'	7. WATER TIGHT PORTABLE PLATE ADDED IN WAY OF GRATING FRS 115-117½ STBD ADJACENT TO CL TO FACILITATE INSTALLATION OF WIREWAY TO AREA BELOW FWD OF FR 116.				
	GEN	8. RAILS IN WAY OF MOORING CHOCKS AFT OF FR 105 REVISED TO SUIT DESIGN DEVELOPMENT OF RAILS AS INDICATED ON DWG NO. 3300-152.				
	4D' 4C'	9. PLATFORM AND INCLINED LADDERS ADDED FRS 107½-108 P/S TO FACILITATE ACCESS IN WAY OF FORE & AFT DECK PIPING.	JDC	12-8-77	[illegible]	
E	[illegible]	1. SUPPLY VENT ADDED FRS 123-124 PORT & FRS 132-135 PORT AND EXHAUST VENT ADDED FRS 120-122 STBD & FRS 133-136 STBD TO SUIT DESIGN DEVELOPMENT OF VENTILATION AS INDICATED ON DWG NO. 2680-383.				
	4D'	2. GATE IN WAY OF RAILS FR 108 PORT ALTERED TO PORTABLE CHAIN RAIL TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO 3300-152.				
	9A' 9D'	3. INCLINED LADDER FRS 83¾-84 P/S, IN WAY OF LOADING MANIFOLD PLATFORM, RELOCATED FROM ABOUT 78'-6" TO 100'-6" OFF CL P/S TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 3300-142. RING LIFEBUOY IN WAY OF SAME RELOCATED FROM OUTBD TO INBD SIDE OF LADDER TO SUIT.				
	9A' 9D'	4. HOSE SADDLE IN WAY OF LOADING MANIFOLD FRS 81-83½ P/S REVISED TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DRAWING NO. 1160-44.				
	10A' 10D'	5. CLOSED CHOCKS IN WAY OF MANIFOLD FRS 81-83 P/S ALTERED FROM 16"x10" TO 20" CLOSED CHOCKS AND FOUNDATION IN WAY OF CHOCKS REVISED TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG. NO. 1203-45. AUXILIARY VIEW OF MANIFOLD FOR G14C ADDED IN PANEL 10-A.	[illegible]	[illegible]	[illegible]	LET NO. 2165Y OF 11-13-78
F	[illegible]	1. RING LIFEBUOY FRS 90-91 P/S, FRS 95-96 P/S & FRS 101-102 P/S IN WAY OF RAILS AT SHIP SIDE RELOCATED INBD TO FIRE STATION HOSE CABINET TO IMPROVE INSTALLATION.				
	[illegible]	2. RING LIFEBUOY WITH WATER LIGHT FRS 87-88 P/S INTERCHANGED WITH RING LIFEBUOY FR 95 P/S TO AGREE WITH DWG NO. 0100-777				
	[illegible]	3. VERTICAL LADDER ADDED IN WAY OF STBD SIDE OF FOAM MONITOR PLATFORM FRS 88-89, FRS 95-96 & FRS 103-104 TO PROVIDE ADDITIONAL ESCAPE FROM PLATFORM AS REQUESTED BY LOCAL COAST GUARD INSPECTOR.				
	[illegible]	4. HELO LANDING AREA FRS 89-94 PORT REVISED. FOAM MONITOR ADDED FRS 88-89 PORT & FRS 94-95 PORT. FOAM READY SERVICE TANK ADDED FR 89 PORT. ALL TO SUIT US COAST GUARD REQUIREMENTS FOR HELO LANDING AREA & NOTED IN NN CHANGE No. 144 OF 3-2-79.				
	9B' 9D'	5. CARGO HATCH FRS 84-85 IN WAY OF WING TANK NO-7 P/S ROTATED 90° TO PERMIT ULLAGE OPENING IN HATCH COVER TO CLEAR HORIZONTAL WEBS BELOW.				
	GEN	6. BOLTED PLATE ADDED IN WAY OF EACH TANK IN CARGO BODY TO IMPROVE ACCESS AND TO FACILITATE OVERHAUL PIPING SYSTEMS	[illegible]	11-1-79		

NO.	REFERENCES	DWG NO.
8	NAV BRIDGE & HOUSE TOP - GEN'L ARRGT.	0100-778
7	ACCOMMODATIONS GEN'L ARRGT IN DKHOUSE	-774
6	UPPER DK AFT OF FR 81 - GENERAL ARRGT	-909
5	UPPER DK FWD OF FR 81 - GENERAL ARRGT	-908
4	2ND DK FWD & 78'-4" FLAT AFT - GENL ARRGT	-917
3	33'-0" & 60'-0" FLAT AFT - GENERAL ARRGT	-770
2	HOLD AFT OF FR 81 - GENERAL ARRGT	-920
1	HOLD FWD OF FR 81 - GENERAL ARRGT	0100-919

AUTHORITY:

GENERAL NOTES:
1. THIS PLAN SUPERSEDES AND REPLACES DWG NO. 0100-772 FOR HULLS G13C AND G14C.
2. SILL HEIGHTS FOR ALL CLOSURES ARE TAKEN AT CL OF CLOSURE AND ABOVE STEEL DECK.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
G14C	310	
G13C	309	

APPROVALS

OWNERS	USPH
LETTER OF 1-29-76	LETTER OF 12-16-75
	USCG LET. 3940/NNS & DD HULLS 613-615 OF 12-18-75

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPT.
FSCM NO. 43689

KEY PLAN

SCALE 1/8" = 1 FT
DRAWN E PARKMAN
CHECKED J.D. CORUM JR.
SECT MGR A. Con Cary
TECH APPROVAL R M Shier
DATE COMPL. 11/18/75
EXAMINED
AUTHORIZED
DATE 11-18-75
CSD APPROVAL E.E.D. for R.L. HARRINGTON

390,000 DWT TANKER
UPPER DECK FORWARD OF FR 81
GENERAL ARRANGEMENT

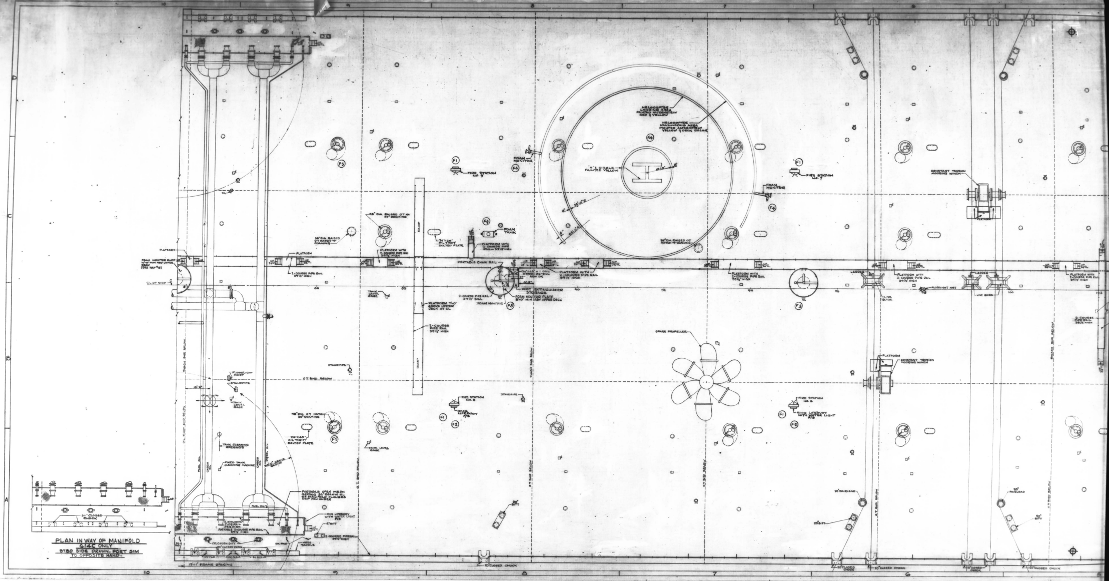
USMA DESIGN T11-S-116a
~~USMA DWG NO.~~
HULL NO. 309 & 310
DWG NO. 0100-908 (SEE NOTE NO. 1)
REV F
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS BLUELINE PRINTS FROM AN AUTO-POSITIVE - CHARGE TO G14C-10079
- SEE BELOW -
DATE 11-1-79 SIGNED [illegible]

FIRST ISSUE	DEPT.	NO. PRTS.	REV.	DATE ISSUED	SPECIAL PRINTS
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

YARD PRINTS
ORDERED BY DESIGN
GROUP:
MC NO.

0100-908
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
FRAME 1
10X

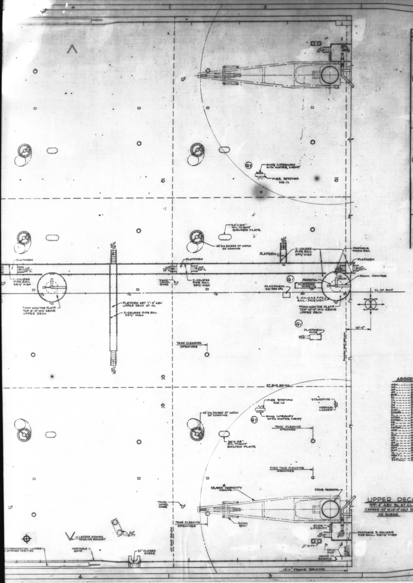

HELOCOPTER LANDING AREA PAINTED ALTERNATELY RED & YELLOW
HELOCOPTER MANEUVERING AREA PAINTED ALTERNATELY YELLOW & DECK COLOR
"H" & CIRCLE PAINTED YELLOW
10'-0"
8"
35'-0" R
45'-0" R
36" DIA RAISED OT HATCH-9" COAMING
F4
FOAM MONITOR
F1
FIRE STATION NO. 9
FIRE STATION NO. 7
FOAM TANK
24"x56" OIL TIGHT BOLTED PLATE
48" DIA. RAISED OT HATCH 30" COAMING
36" DIA RAISED OT HATCH 9" COAMING
PLATFORM
PLATFORM WITH 2-COURSE PIPE RAIL 39½" HIGH
2-COURSE PIPE RAIL 39½" HIGH
UP 24'IL
FOAM MONITOR PLATF 10'-0" MIN ABV UPPER DECK (SEE REF #G)
CL OF SHIP
PORTABLE CHAIN RAIL
36"x48" WT DOOR 36" SILL ABV DK
FIRE EXTINGUISHER STORAGE
FOAM MONITOR PLATF 8'-0" MIN ABV UPPER DECK
2-COURSE PIPE RAIL 39½" SILL
FOAM MONITOR
F3
TANK LEVEL GAGE
RAMP
PLATFORM 7'-0" ABOVE UPPER DECK AT CL
LADDER
LINE GUIDE
FLOODLIGHT MAST
CONSTANT TENSION MOORING WINCH
82
84
86
90
92
94
96
98
100
102
SPARE PROPELLER
STANDPIPE
OT BHD BELOW
SWASH BHD BELOW
OIL TIGHT BHD BELOW
10'-2"
TANK LEVEL GAGE
TANK CLEANING OPENINGS
FIXED TANK CLEANING MACHINE
FUEL OIL
CARGO OIL
DIESEL OIL
34'-0" CRANE RADIUS
48" DIA. OT HATCH 30" COAMING
24"x48" OIL TIGHT BOLTED PLATE
F5
FIRE STATION NO. 8
RING LIFEBUOY P/S
FIRE STATION NO. 6
RING LIFEBUOY WITH WATER LIGHT P/S
F2
20" FAIRLEAD
20" BITT
20" CLOSED CHOCK
PORTABLE OPEN MESH GRATING 36" BELOW CL OF MANIFOLD FLANGES DRIP PAN UNDER
2-COURSE PIPE RAIL 39½" HIGH
PORTABLE 2-COURSE PIPE RAIL 39½" HIGH
12" BITT
2 COURSE PIPE RAIL 39½" HIGH
CRUCIFORM BITT
DK PAD
HOSE SADDLE
17'-11" FRAME SPACING
PLAN IN WAY OF MANIFOLD
614C ONLY
STBD SIDE DRAWN - PORT SIM
TO OPPOSITE HAND -
A
B
C
D
10
9
8
7
6
5

0100-908

SEPT. '80

FRAME 2

10X


RING LIFEBUOY WITH WATER LIGHT
FIRE STATION NO.11
24"x 48" OIL TIGHT BOLTED PLATE
48" DIA RAISED OT HATCH 30" COAMING
PLATFORM
2-COURSE PIPE RAIL 39½" HIGH
PORTABLE CHAIN RAIL
FOAM MONITOR
PEDESTAL
PLATFORM 24" ABV DK
CL OF SHIP
FOAM MONITOR PLATF TOP 10'-0" MIN ABOVE UPPER DECK
PLATFORM ABT 7'-0" ABV UPPER DECK AT CL
TANK LEVEL GAGE
TANK CLEANING OPENINGS
OT BHD BELOW
FIRE STATION NO.10
RING LIFEBUOY WITH WATER LIGHT
STANDPIPE
VERTICAL LADDER
FIXED TANK CLEANING MACHINES
35,000# CAPACITY CRANE
CRANE PEDESTAL
BOOM REST
RING LIFEBUOY
20" BITT
20" CLOSED CHOCK
LADDER STOWAGE HANDLING BRACKET
PORTABLE GATE
17'-11" FRAME SPACING

ABBREVIATIONS

ABV	ABOVE
AO	ACCESS OPENING
AP	AFTER PERPENDICULAR
AT	AIRTIGHT
BHD	BULKHEAD
BL	BASE LINE
CL	CENTER LINE
DIA	DIAMETER
DK	DECK
DN	DOWN
ELEV	ELEVATOR
ENGRS	ENGINEERS
FL	FIXED LIGHT
FNTMH	FLUSH NON-TIGHT MANHOLE HINGED
FOTMH	FLUSH OILTIGHT MANHOLE HINGED
FR	FRAME
FT	FUME-TIGHT
FWTMH	FLUSH WATERTIGHT MANHOLE HINGED
HWO	HATCHWAY OVER
IL	INCLINED LADDER
MIN	MINIMUM
NO.	NUMBER
NT	NON-TIGHT
OT	OILTIGHT
PLATF	PLATFORM
ROT	RAISED OILTIGHT
RWT	RAISED WATERTIGHT
VL	VERTICAL LADDER
WEA-T	WEATHER-TIGHT
WT	WATERTIGHT
FFTMH	FLUSH FUME TIGHT MANHOLE HINGED

UPPER DECK
99'-4" ABV BL AT CL
CAMBER: 52" IN 114'-0" HALF BEAM
NO SHEER

REVISIONS

REV	ZONE	DESCRIPTION	DATE	OWNER APPD
A		INITIAL ISSUE		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(CONTINUED AT LEFT)

AUTHORITY:

GENERAL NOTES:
1. SILL HEIGHTS FOR ALL DOORS ARE TAKEN AT CL OF DOOR AND ABOVE STEEL DECK.
2. THIS PLAN SUPERSEDES & REPLACES DWG NO. 0100-775 FOR HULLS NO. G13C & G14C.

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS BLUELINE PRINTS FROM AN AUTO POSITIVE – CHARGE TO 614C-10079 – SEE BELOW –
DATE 11-1-79 SIGNED McM[illegible]

NO.	REFERENCES	DWG NO.
8	NAV BRIDGE & HOUSE TOP GENERAL ARRANGEMENT	0100-778
7	ACCOMMODATIONS GEN'L ARRGT IN DECKHOUSE	0100-774
6	UPPER DK AFT OF FR 81 GENERAL ARRANGEMENT	0100-909
5	UPPER DK FWD OF FR 81 GENERAL ARRANGEMENT	0100-908
4	SECOND DK FWD & 78'-4" FLAT AFT GEN'L ARRGT	0100-917
3	55'-0" & 60'-0" FLAT AFT GENERAL ARRANGEMENT	0100-770
2	HOLD AFT OF FR 81 GENERAL ARRANGEMENT	0100-920
1	HOLD FWD OF FR 81 GENERAL ARRANGEMENT	0100-919

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
G14C	310	
G13C	309	

APPROVALS
OWNERS LETTER OF 12-31-75
USPH LETTER OF 11-20-75
USCG LET. [illegible] HULLS G13-G15 OF 12-15-75

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING DEPARTMENT

KEY PLAN

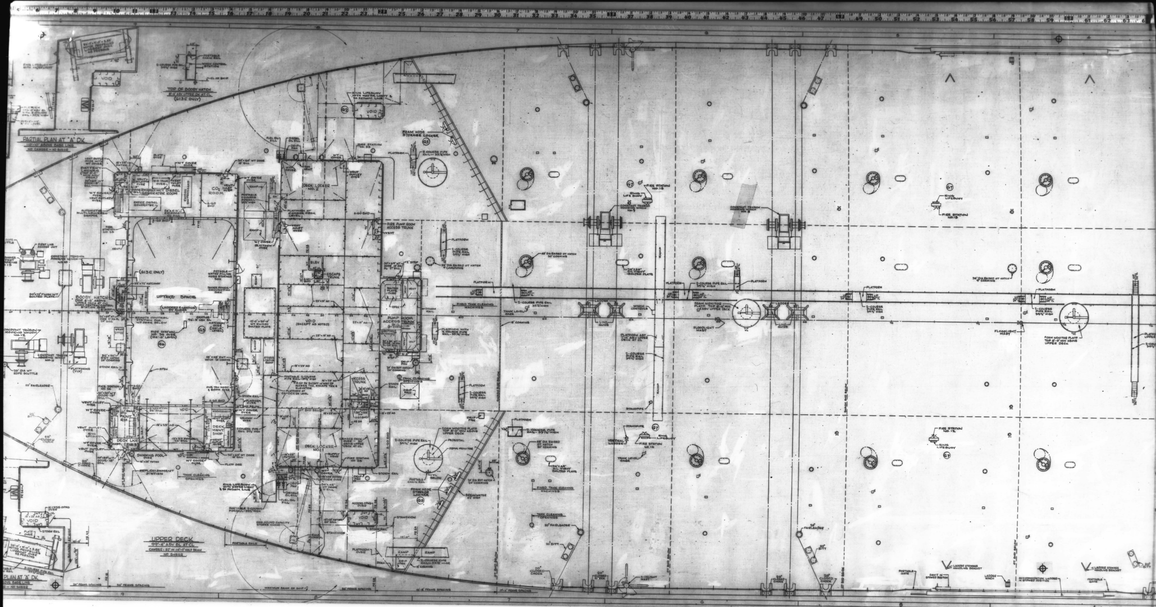
SCALE 1/8" = 1 FT
DRAWN J.D. BENTON, JR.
CHECKED J.B. CORUM, JR.
SECT MGR A. Conley
DATE COMPL. 11-6-75
EXAMINED
AUTHORIZED
DATE 11-6-75
TECH APPROVAL
CSD APPROVAL

390,000 DWT TANKER
UPPER DK AFT OF FR 81
GENERAL ARRANGEMENT

USMA DESIGN T11-S-116a
HULL NO. 309 & 310
DWG NO. 0100-909
SEE NOTE NO. 2
REV G
SHEET NO. 1 OF 1

0100.909

SEPT. '80
FRAME 1
10X


PARTIAL PLAN AT "A" DK
110'-10" ABOVE BASE LINE
NO CAMBER ~ NO SHEER
TOP OF BOOBY HATCH
8'-0" ABV UPPER DK AT CL
(613C ONLY)
26'-0" x 9'-0" x 3.83' MOTOR PROPELLED LIFEBOAT OVER 48 PERSONS
RING LIFEBUOY WITH WATERLIGHT
VOID
WALKWAY "A" DK LEVEL
BATTERY LOCKER
EMERGENCY DIESEL GENERATOR ROOM
CO2 ROOM
DO TANK OVER
VENT INLET OVER
W.T. COVER OVER
BOOBY HATCH
UPTAKE SPACE
(613C ONLY)
DECK LOCKER NO. 2
DECK LOCKER NO. 1
ESCAPE TRUNK
VOID (EXCEPT AS NOTED)
PUMP ROOM ACCESS TRUNK
ACCESS TRUNK
FIRE PUMP ROOM ACCESS TRUNK
FOAM HOSE STORAGE LOCKER
FOAM MONITOR
DECK LKR
PAINT
DECK MAINT SHOP
SWIMMING POOL OVER
REPLENISHMENT STATION
TANK CLEANING OPENINGS
FIXED TANK CLEANING MACHINES
CONSTANT TENSION MOORING WINCH
FIRE STATION
RING LIFEBUOY
PLATFORM
2-COURSE PIPE RAIL 39½" HIGH
FLOODLIGHT MAST
LINE GUIDE
LADDER
RAMP
STANDPIPE
VERTICAL LADDER
TANK LEVEL GAGE
30" DIA RAISED OT HATCH 30" COAMING
24"x42" OIL TIGHT BOLTED PLATE
30" FAIRLEADER
20" BITT
20" CLOSED CHOCK
ACCESS OPNG OVER
STORM RAIL
PLATE OVER
BULWARK 42" HIGH
10'-0"
PORTABLE RAILS
6000 POUND CAPACITY STORES CRANE
CRANE PEDESTAL
STANCHION
PLATFORM OVER
DIESEL OIL FILL
FUEL OIL FILL
PORTABLE 2-COURSE PIPERAIL - 39½" HIGH
UPPER DECK
99'-4" ABV BL AT CL
CAMBER: 52" IN 114'-0" HALF BEAM
NO SHEER
PLAN AT "A" DK
ABOVE BASE LINE
~ NO SHEER
24" FRAME SPACING
36" FRAME SPACING
MAXIMUM BEAM OF SHIP
LADDER STOWAGE HANDLING BRACKET
DAVIT IN STOWED POSITION
LADDER WINCH
ACCOMMODATION LADDER IN STOWED POSITION
PORTABLE GATE
9
8
7
6

0100.909

MICRO-MASTER® 105 mm

K+E

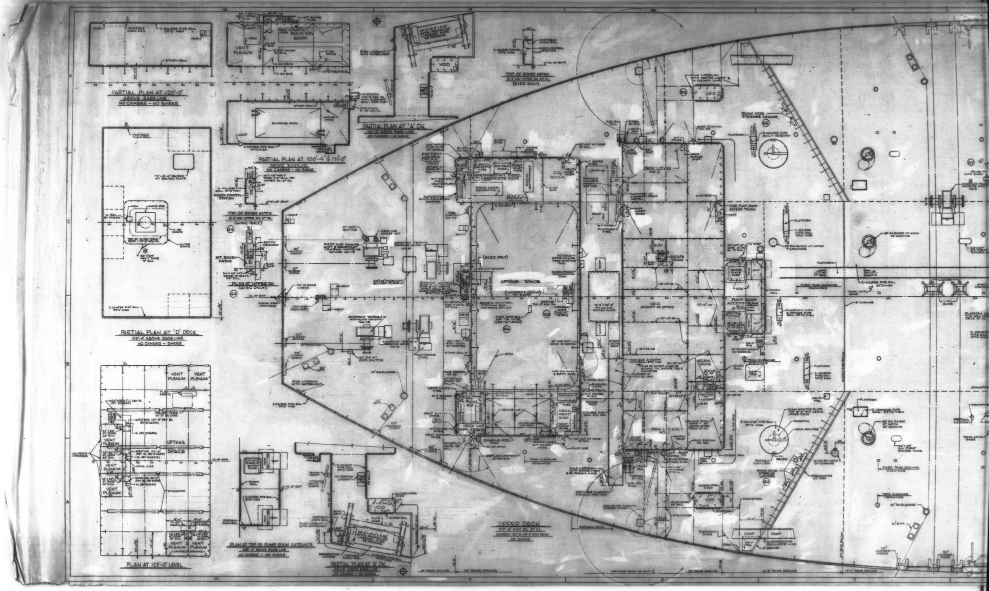
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

KEUFFEL & ESSER CO.

SEPT. '80

10X

FRAME 2


PARTIAL PLAN AT 120'-0" ABOVE BASELINE NO CAMBER - NO SHEER
PARTIAL PLAN AT 108'-4" & 111'-0" ABOVE BASELINE NO CAMBER - NO SHEER
PARTIAL PLAN AT "A" DK 110'-10" ABOVE BASE LINE NO CAMBER - NO SHEER
TOP OF BOOBY HATCH
PLAN AT UPPER DK
PARTIAL PLAN AT "D" DECK 135'-4" ABOVE BASE LINE NO CAMBER - SHEER
PLAN AT 123'-0" LEVEL
PLAN AT TOP OF PUMP ROOM ENTRANCE 108'-4" ABOVE BASE LINE NO CAMBER - NO SHEER
PARTIAL PLAN AT "A" DK 110'-10" ABOVE BASE LINE NO CAMBER - NO SHEER
UPPER DECK
99'-4" ABV BL AT CL
CAMBER: 32" IN 114'-0" HALF BEAM
NO SHEER
UPTAKE SPACE
VENT PLENUM
SWIMMING POOL
BULK CO2 ROOM
VOID
DECK LOCKER NO. 2
DECK LOCKER NO. 1
PUMP ROOM ACCESS TRUNK
BOOBY HATCH
36" FRAME SPACING

0100.909

MICRO-MASTER 105 mm

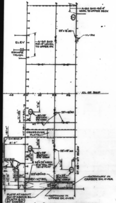
K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

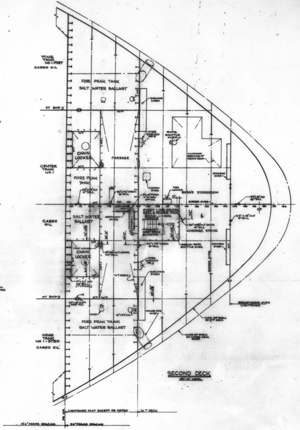
SEPT. '80

10X

FRAME 1


A-60 BHD 94'-4" LEVEL TO UPPER DK
ELEV
A-60 BHD 94'-4" LEVEL TO UPPER DK
ESCAPE TRUNK
CROSSOVER PLATE
HATCHWAY IN UPPER DK OVER
HATCHWAY IN CAREER DK OVER
CL OF SHIP

AN AT 94'-4" LEVEL - TOP OF WATER TANKS



SECOND DECK
67'-10" LEVEL

ABBREVIATIONS

ABV - - - - - ABOVE
AO - - - - - ACCESS OPENING
AP - - - - - AFTER PERPENDICULAR
BEL - - - - - BELOW
BHD - - - - - BULKHEAD
CL - - - - - CENTER LINE
COAM - - - - COAMING
DN - - - - - DOWN
ELEV - - - - ELEVATOR
EM - - - - - EXPANDED METAL
ENGRS - - - ENGINEERS
FP - - - - - FORWARD PERPENDICULAR
FS - - - - - FIRE SCREEN
FT - - - - - FUME-TIGHT
IL - - - - - INCLINED LADDER
LR - - - - - LADDER RUNGS
MHO - - - - MANHOLE OVER
MJ - - - - - METAL JOINER
NT - - - - - NON TIGHT
OT - - - - - OILTIGHT
PLATF - - - - PLATFORM
ROTMH - - - RAISED OILTIGHT MANHOLE HINGED
RWTMH - - - RAISED WATERTIGHT MANHOLE HINGED
STAN - - - - STANCHION
STBD - - - - STARBOARD
VL - - - - - VERTICAL LADDER
WT - - - - - WATERTIGHT

REVISIONS CONTINUED

REV	ZONE	DESCRIPTION	NNS DATE	LPDCO AUTH	OWNER DATE	OWNER APPD
C (CONT)	4-B' 4-C'	19. ARRANGEMENT OF BOATSWAIN STOREROOM & CORDAGE SPACE FWD OF FR 124 P/S ADDED TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 7700-545.				
	7-B'	20. GRATING (BY ENGRS) ADDED FRS 23-25 P/S IN WAY OF MACHINERY SPACE TO SUIT DESIGN DEVELOPMENT OF MACHINERY SPACE ARRANGEMENT.				
	6-C'	21. SHELVES ADDED IN ENGINEERS STOREROOM FRS 44-50 PORT TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 7700-549.				
	6-A' 7-A'	22. VL IN WAY OF MHO FRS 46-47 STBD RELOCATED FROM FWD TO AFT SIDE OF MHO & VL IN WAY OF MHO FRS 23-25 STBD RELOCATED FROM AFT TO FWD SIDE OF MHO TO FACILITATE INSTALLATION OF OVERBD PIPES AS REQUESTED BY OUR PIPING ENGINEERS.	EP C.	4C	LET NO OF 2-	1383V 1-77
D	4-B' 4-C'	1. FOOTHOLE ACCESS IN WAY OF CHAIN LOCKER FR 116 P/S REVISED TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 1049-671.				
	3-C' 4-C'	2. SILL OF ACCESS OPENING FRS 111-112 IN CL BHD ALTERED FROM 7½" TO 11" & SILL OF ACCESS OPENING FRS 144-145 IN CL BHD ALTERED FROM 40½" TO 41" TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 1030-479.				
	GEN.	3. FIRE STATIONS THRUOUT RENUMBERED TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 2400-759.				
	6-A' 6-C' 7-A' 7-D'	4. OPENING FOR TANK CLEANING MACHINE ADDED IN 78'-4" FLAT FRS 30-31 P/S, FRS 39-40 STBD, FRS 41-42 PORT & FRS 56-57 P/S TO FACILITATE TANK CLEANING IN FUEL OIL & S W BALLAST TANKS.				
	6-C'	5. IN ENGINEERS STOREROOM FRS 46-50 PORT, INBD BHD & DOOR IN WAY OF SAME REVISED AND RELOCATED AND SHELVING IN STOREROOM REARRANGED TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 7700-625.				
	6-C'	6. 18"×30" EM DOOR ADDED IN WAY OF ACCESS OPENING IN TRANSV BHD FR 50 ABOUT 37'-6¼" OFF CL PORT TO SECURE ENGINEERS STOREROOM AS REQUESTED BY OWNERS LET. NO. 1383V OF 2-1-77.				
	7-A'	7. POSITION OF FIRST LINE ASHORE REEL IN BOATSWAINS STOREROOM FRS 1-6 PORT REVISED & DIRECTIONAL SHEAVE AND FLEET ANGLE ELIMINATOR SHEAVE RELOCATED TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 1203-52.				
	5-B'	8. RAIL AT EDGE OF HORIZONTAL GIRDER ON FWD SIDE OF TRANSV BHD FR 59 P/S ALTERED FROM 1-COURSE 36" HIGH TO 2-COURSE 42" HIGH TO AGREE WITH DWG NO. 3300-212.				
	5-B' 6-B'	9. ENGINEERS STOREROOM ADDED FRS 44-50 STBD ON 78'-4" FLAT, PLAN AT 94'-4" LEVEL REVISED AND ACCESS BETWEEN MACHINERY SPACE ON 78'-4 LEVEL AND UPPER DECK OVER MODIFIED. ALL TO SUIT N.N. CHG NO. 134 OF 4-27-78.				
	6-D'	10. INDICATION OF GRATING OVER ADDED FRS 39-42 STBD IN WAY OF LO STORAGE & SETTLING TANKS TO SUIT DESIGN DEVELOPMENT. VERTICAL LADDERS IN WAY OF SAME REVISED TO SUIT.	JBC	[illegible]	LET NO OF 9-	2005V 7-78
E	5-D'	1. PLAN AT 94'-4' LEVEL: INBD EXPANDED METAL BHD OF PASSAGE FRS 48-50 STBD, IN WAY OF ENGINEERS STRM, REVISED TO SUIT DESIGN DEVELOPMENT AS REQUESTED BY OUR MACHINERY ENGINEERS.				
	6-D'	2. 78'-4" FLAT: CABINETS ADDED IN ENGINEERS STOREROOM FRS 44-50 STBD TO SUIT CHANGE NO. 138 AND AS SHOWN ON DWG NO. 7700-783. EM DOOR TO STOREROOM RELOCATED FROM AFT BHD TO INBD BHD OF STOREROOM TO SUIT.				
	7-D'	3. 78'-4" FLAT: VERTICAL LADDER FRS 24-25 PORT RELOCATED FROM AFT TO FWD SIDE OF MANHOLE OVER TO CLEAR PIPING AS REQUESTED BY OUR MACHINERY ENGINEERS.				
	6-B' 6-C'	4. 78'-4" FLAT: FLOORPLATE ADDED FRS 38-40 P/S IN WAY OF OPENING IN DECK PLATING TO FACILITATE ACCESS IN WAY OF ARCH IN TRANSV BHD FR 38 AT 10'-6" OFF CL P/S.				
	7-D'	5. 78'-4" FLAT: UP & DOWN ACCESS FRS 54-58 CL REVISED TO SUIT DESIGN DEVELOPMENT OF ACCESS IN MACHINERY SPACE AS INDICATED ON DWG NO. 6650-258.	JBC		LET NO. OF 11-	2145V 13-78
F	5-C'	1. 78'-4" FLAT: RAILS ADDED IN WAY OF SECONDARY ACCESS HATCHWAY IN WEB 78'-4" ABOVE BL FRS 59-59½ PORT TO SUIT U S COAST GUARD REQUIREMENTS FOR RAIL PROTECTION IN WAY OF HATCHWAYS. THIS IS PART OF NN CHANGE NO. 41.	JBC		LET. NO OF 12-	2167V 22-78
G	4-B'	1. SECOND DECK: DOORS ADDED TO FIRE STATION NO. 1 & 2 TO SUIT INSTALLATION ON SHIP.				
	7-B' 7-C'	2. 78'-4" FLAT: GRATING 81'-6" ABOVE BL AND INCLINED LADDERS IN WAY OF SAME ADDED FRS 35-37 P/S TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 6650-258.				
	6-D' 7-B'	3. 78'-4" FLAT: THREE STORAGE CABINETS RELOCATED FROM FRS 45-47 STBD IN ENGINEERS STOREROOM (VALVE & PIPE IN THIS LOCATION) TO FRS 9-14 STBD IN PASSAGE TO SUIT INSTALLATION ON SHIP.	JBC		LET NO OF 4-	2178V 26-79
H	7-C'	1. 78'-4" FLAT: APPLICABILITY OF SPARE TAIL SHAFT AND INDICATION OF BOLTED PLATE OVER FRS 9-13 PORT EXTENDED TO 614C TO SUIT CHG NO. 148 OF 4-26-79.	JBC	[illegible]		

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DDCO DATE	AUTH	OWNER DATE	OWNER APPD
A		INITIAL ISSUE	5/14/6	AC		
B	4-B' 4-C'	1. INDICATION OF HATCH OVER FRS 124-126 PORT RELOCATED FARTHER OUTBD & FWD AND INDICATION OF MANHOLE OVER FRS 114-116 STBD ADJACENT TO CL DELETED. ALL TO AGREE WITH REF NO. 8. VERTICAL LADDER FRS 114-116 STBD ADJACENT TO CL DELETED TO SUIT.				
	4-B'	2. STIFFENERS ON TRANSV BHD FR 124 RELOCATED FROM AFT TO FWD SIDE OF BHD TO SUIT DESIGN DEVELOPMENT.				
	4-B' 4-C'	3. AFT BHD OF CHAIN LOCKER FRS 109-116 P/S RELOCATED FROM FR 109 TO 30" FWD OF FR 109 TO SEGREGATE CHAIN LOCKERS FROM CARGO TANK AS REQUIRED BY US COAST GUARD REGULATIONS. STIFFENERS ON TRANSV BHD FR 109 INBD OF LONG. BHD 39'-0⅛" OFF CL P/S RELOCATED FROM AFT TO FWD SIDE OF BHD TO SUIT.				
	5-B'	4. IN PLAN AT 94'-4" LEVEL LONG. BHD 36'-0" OFF CL STBD EXTENDED TO UPPER DECK OVER & 23"×24" ACCESS OPENING ADDED FRS 54-55 IN SAME TO SUIT STRUCTURAL DEVELOPMENT AS INDICATED ON DWG NO. 1110-640.				
	5-B'	5. ONE COURSE RAIL ADDED AT EDGE OF WEB ON FORWARD SIDE OF TRANSV BHD FR 59 TO SUIT CHANGE NO. 6 OF 7-18-75.				
	1-B' 6-C'	6. GRATING & INCLINED LADDERS ADDED IN PUMP ROOM ACCESS TRUNK FRS 58-59 CL TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 6650-251. RESERVATION NO. 1 RELEASED TO SUIT.				
	6-B' 6-C'	7. VENTS ADDED IN PUMP ROOM ACCESS TRUNK FRS 58-59 P/S TO SUIT DESIGN DEVELOPMENT OF VENTILATION.				
	6-C'	8. VERTICAL LADDER ADDED IN ELEVATOR SHAFT FRS 48-50 PORT FOR EMERGENCY EGRESS FROM ELEVATOR.				
	6-A' 7-A'	9. STANCHION FRS 26, 29 & 32 RELOCATED FROM 60'-0" OFF CL TO OUTBD SIDE OF STANCHION TO 60'-0" OFF CL TO INBD EDGE. STANCHION FRS 35, 38, 41 & 44 RELOCATED FROM 60'-0" OFF CL TO OUTBD SIDE OF STANCHION TO TO 58'-10¼" OFF CL TO INBD EDGE. STANCHION FR 54 RELOCATED FROM 54'-0" OFF CL TO OUTBD SIDE OF STAN TO 52'-10¼" OFF CL TO INBD EDGE. ALL TO AGREE WITH DWG NO. 1230-65.				
	6-B'	10. LUBE OIL TANK FRS 38-41 STBD REDESIGNATED FROM STORAGE TO SETTLING TANK & LUBE OIL TANK FRS 41-44 STBD REDESIGNATED FROM SETTLING TO STORAGE TANK TO SUIT DESIGN DEVELOPMENT OF MACHINERY SPACE.				
	6-B'	11. HATCHWAY 48" FWD OF FR 44 & 25'-6" OFF CL STBD ALTERED FROM 33"×66" TO 30"×66". 48"×48" HINGED PLATE FRS 38-40 STBD RELOCATED TO 21'-0" OFF CL & ALTERED TO 60"×60" OPENING (GRATING BY ENGRS). ARCH IN TRANSV BHD FR 38 RELOCATED FROM 24'-0" TO 22'-6" OFF CL STBD. ALL TO SUIT DESIGN DEVELOPMENT OF MACHINERY SPACE ARRANGEMENT AS REQUESTED BY OUR MACHY ENGRS.				
	7-C'	12. MANHOLE FRS 22-23 RELOCATED FROM 7'-6" TO 54" OFF CL PORT TO IMPROVE ACCESS TO AFT PEAK TANK BELOW.				
	6-B'	13. MANHOLE FRS 4-5 STBD RELOCATED FROM 21" TO 17" OFF CL TO SUIT DESIGN DEVELOPMENT AS SHOWN ON DWG NO. 1140-98.				
	8-C'	14. FIRE STATION ADDED FR 4 STBD IN STEERING GEAR ROOM TO SUIT DWG NO. 2400-959.				
	7-C'	15. INDICATION OF BOLTED PLATE OVER (FOR 613C ONLY) ADDED FRS 10-13 ABOUT 13'-6" OFF CL PORT TO SUIT REF NO. 6.				
	7-B' 7-C'	16. SPARE TAILSHAFT (613C ONLY) SHOWN STORED FRS 10-12 PORT (RELOCATED FROM FRS 21-23 PORT ON UPPER DECK) AS DISCUSSED WITH OWNERS REPRESENTATIVE ON 4-12-76. MANHOLE FRS 9-10 STBD RELOCATED FROM 54" TO 19'-6" OFF CL STBD & MJ DOOR IN TRANSV. BHD FR 9 RELOCATED FROM 36" OFF CL PORT TO 12'-6" OFF CL STBD TO SUIT.				
	4-B' 8-C'	17. FIRST LINE ASHORE REEL ADDED FRS 124-132 STBD IN FIRST LINE ASHORE & POWER PACK ROOM & AT FRS -3 TO 2 PORT IN BOATSWAIN STOREROOM TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 1203-52.				
	6-C'	18. INBD BHD OF FIRE PUMP ROOM ACCESS TRUNK FRS 56½-58 PORT RELOCATED FROM 58" TO 72" INBD OF LONG. BHD 39'-0⅛" OFF CL TO IMPROVE ACCESS.				
	7-B'	19. FT METAL JOINER DOOR WITH CLOSER ADDED IN CASING IN WAY OF HORIZONTAL SLIDING DOOR IN TRANSV BHD FR 23 STBD TO SUIT US COAST GUARD REQUIREMENTS FOR STRUCTURAL FIRE PROTECTION. THIS IS PART OF CHANGE NO. 79 OF 5-7-76	EP C.		LET NO OF 7-28	1003V -76
C	4-B' 4-C'	1. 2ND DECK: INDICATION OF HAWSE PIPE OVER FRS 123-127 P/S REVISED TO SUIT DESIGN DEVELOPMENT.				
	4-A'	2. ON TRANSV BHD 124, STIFFENERS RELOCATED TO AFTER SIDE OF BHD TO SUIT STRUCTURAL DEVELOPMENT AS INDICATED ON DWG NO. 1040-820.				
	3-C' 4-C'	3. AO IN CL LONG BHD RELOCATED FROM FRS 146-147 TO FRS 144-145 & SILL ALTERED FROM 9" TO 40½" & SILL OF AO FRS 111-112 ALTERED FROM 9" TO 7½". VERTICAL STIFFENERS RELOCATED FROM PORT TO STBD SIDE. ALL TO AGREE WITH DWG NO. 1030-479.				
	4-B' 4-C'	4. SILL OF AO FR 111-112 IN LONG. BHD 39'-0⅛" OFF CL P/S ALTERED FROM 9" TO 48½" TO SUIT STRUCTURAL DEVELOPMENT AS INDICATED ON DWG NO. 1030-549. LADDER RUNGS ADDED IN WAY OF SAME TO SUIT.				
	5-B'	5. 23"×18" ACCESS OPENING ADDED IN TRANSV WEB FR 54 AT 31'-6" OFF CL STBD IN PLAN AT 94'-4" LEVEL TO FACILITATE ACCESS.				
	5-C' 6-C'	6. VERTICAL LADDER FR 57-58 RELOCATED FROM 28'-6" TO 22'-6" OFF CL PORT & AO IN TRANSV BHD FR 57 IN PLAN AT 94'-4" LEVEL RELOCATED FROM 28'-6" TO 22'-6" OFF CL PORT TO CLEAR PIPING AS REQUESTED BY OUR MACHINERY ENGINEERS.				
	6-A' 6-B' 6-C' 6-D' 7-A' 7-D'	7. INDICATION OF TANK CLEANING OPENING OVER ADD FRS 58-59 IN WAY OF FUEL OIL SETTLING TANK P/S, FRS 56-57 P/S IN WAY OF FUEL OIL TANK, FRS 41-42 PORT, FRS 39-40 STBD & FRS 30-31 P/S IN WAY OF SW BALLAST TANK TO AGREE WITH REF 6. LIGHTENING OPENING FR 58-59 P/S IN WAY OF FUEL OIL SETTLING TANK REVISED TO SUIT.				
	6-B' 6-B'	8. TRANSV BHD ADDED FR 50 BETWEEN 36'-0¼" & 39'-0⅛" OFF CL STBD TO SUIT DWG NO. 1040-809. 30"×72"×8'-6" SILL ARCH ADDED IN SAME & PLATFORM 88'-4" ABOVE BL BETWEEN 36'-0¼" AND 39'-0⅛" OFF CL STBD RELOCATED TO 86'-4" ABOVE BL & EXTENDED AFT TO ABOUT FR 49 AND INCLINED LADDERS IN WAY OF PLATFORM RELOCATED TO SUIT.				
	[illegible]	9. FIRE STATIONS ADDED IN MACHINERY SPACE TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 2400-1020.				
	5-C' 6-C' 7-B'	10. FWD BHD OF ELEVATOR & ESCAPE TRUNK FR 50 PORT BET. 94'-4" ABV BL & UPPER DK OVER & AFT BHD OF FIRE PUMP ROOM ACCESS TRUNK FR 57 BET. 33'-0" & 36'-0" OFF CL PORT FROM 94'-4" ABV BL TO UPPER DK OVER NOTED TO BE A-60 CLASS BHD. AFT & INBD BHDS OF FIRE PUMP ROOM ACCESS TRUNK FRS 57-58 PORT, INBD, OUTBD & AFT BHD OF ELEVATOR & ESCAPE TRUNK FRS 48-50 PORT; TRANSV BHD FR 25 INBD OF 39'-0⅛" OFF CL P/S NOTED TO BE A-60 CLASS BHD. METAL JOINER DOOR IN TRANSV BHD FR 23 IN WAY OF WT SLIDING DOOR 48" OFF CL STBD NOTED TO BE A FIRE SCREEN DOOR. ALL TO SUIT USCG REQUIREMENTS FOR FIRE PROTECTION.				
	6-C'	11. ENGINEERS STOREROOM ADDED FRS 44-50 BET. 24'-0" & 39'-0⅛" OFF CL PORT TO SUIT DESIGN DEVELOPMENT OF MACHINERY SPACE ARRANGEMENT AS INDICATED ON DWG NO. 257324.				
	6-B'	12. HATCHWAY BET. FRS 44-46 STBD RELOCATED FROM 25'-6" TO 28'-6" OFF CL TO SUIT DESIGN DEVELOPMENT OF MACHINERY SPACE ARRANGEMENT AS REQUESTED BY OUR MACHINERY ENGINEERS.				
	6-B' 6-C'	13. ARCH IN TRANSV BHD FR 44 RELOCATED FROM 22'-6" TO 21'-0" OFF CL P/S & ALTERED FROM 30"×69"×9" SILL TO 60"×60"×18" SILL TO ACCOMMODATE SHIPPING MACHINERY IN MACHINERY SPACE.				
	6-B'	14. OPENING IN 78'-4" FLAT FRS 38-40 AT 21'-0" OFF CL STBD ALTERED FROM 60"×60" TO 60"×72" TO FACILITATE SHIPPING OF MACHINERY IN MACHINERY SPACE AS REQUESTED BY OUR MACHINERY ENGINEERS.				
	7-B' 7-C'	15. ARCH IN TRANSV BHD FR 38 RELOCATED FROM 22'-6" TO 22'-10" OFF CL P/S & 26"×69"×9" SILL ARCH ADDED IN TRANSV BHD FR 38 AT 10'-6" OFF CL P/S TO SUIT DEVELOPMENT OF MACHINERY SPACE ARRANGEMENT.				
	7-D'	16. INDICATION OF MHO FRS 23-25 PORT IN WAY OF S W BALLAST TANK RELOCATED FROM ABOUT 36" TO ABOUT 52" FWD FR 23 TO AGREE WITH REF 6. VERTICAL LADDER IN WAY OF SAME RELOCATED FWD TO SUIT.				
	[illegible]	17. ACCESS OPENING IN 78'-4" FLAT FRS 27-28 & FRS 45-46 RELOCATED FROM ABOUT 43'-6" TO 46'-6" OFF CL P/S TO IMPROVE ACCESS. VL BELOW IN WAY OF SAME RELOCATED TO SUIT.				
	7-B' 7-C'	18. ARRANGEMENT OF BOATSWAIN STORES AFT OF FR 23 PORT & CORDAGE SPACE AFT OF FR 23 STBD ADDED TO SUIT DEVELOPMENT AS SHOWN ON DWG NO. 770-546.				

REVISIONS CONTINUED AT LEFT

AUTHORITY:

GENERAL NOTES:
1. THIS PLAN SUPERSEDES & REPLACES DWG NO. 0100-771 FOR HULLS NO. 613C & 614C.
2. SILL HEIGHTS FOR ALL CLOSURES ARE TAKEN AT CL OF CLOSURE AND ABOVE STEEL DECK.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS	
OWNERS LET OF 3-26-75 LET OF 2-17-76	USPH LETTER OF 12-23-75
	USCG LETTER 5940/NNS & DD HULLS 613-614 SER 3023 DATED 6-8-76

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING DEPT.

KEY PLAN

SCALE 1/8" = 1 FT
DRAWN E. PARKMAN
CHECKED J. B. COBURN, JR.
SECT MGR
DATE COMPL 10/22/75
EXAMINED
AUTHORIZED
DATE 10-22-75
TECH APPROVAL
C S D APPROVAL

390,000 DWT TANKER
SECOND DK FWD & 78'-4" FLAT AFT
GENERAL ARRANGEMENT

USMA DESIGN T11-S-116A
HULL NO 309, 310
DWG NO. 0100-917
SEE NOTE NO. 1
REV H
SHEET NO. 1 OF 1

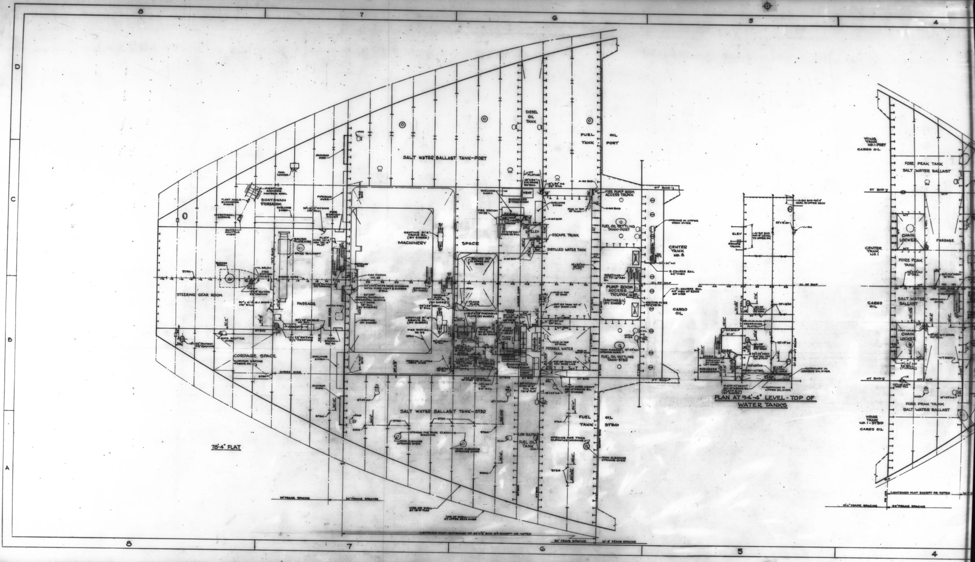
NO.	REFERENCES	DWG NO.
8	NAVIGATION BRIDGE & HOUSE TOP GENERAL ARRGT	0100-778
7	ACCOMMODATIONS GENERAL ARRANGEMENT IN DECKHOUSE	0100-774
6	UPPER DECK AFT OF FRAME 81 GENERAL ARRANGEMENT	0100-909
5	UPPER DECK FORWARD OF FRAME 81 GENERAL ARRANGEMENT	0100-908
4	SECOND DECK FORWARD & 78'-4" FLAT AFT GENERAL ARRANGEMENT	0100-917
3	31'-0" & 60'-0" FLAT AFT GENERAL ARRANGEMENT	0100-770
2	HOLD AFT OF FRAME 81 GENERAL ARRANGEMENT	0100-920
1	HOLD FORWARD OF FRAME 81 GENERAL ARRANGEMENT	0100-919

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING No
REMARKS BLUELINE PRINTS FROM AN AUTO-POSITIVE ~ CHARGE TO 614C-10079.
DATE 11-1-79 SIGNED
YARD PRINTS
ORDERED BY DESIGN
GROUP: MC NO.

0100.917

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.

SEPT. '80
FRAME 1
10X


8
7
6
5
4
D
C
B
A
SALT WATER BALLAST TANK-PORT
DIESEL OIL TANK
FUEL OIL TANK PORT
JACKROD OVER
TOOL LOCKER
FIRST LINE ASHORE HAWSER REEL
FLEET ANGLE ELIMINATOR SHEAVE
DIRECTIONAL SHEAVE
BOATSWAIN STOREROOM
SHELVING 3 HIGH
ROPE SCUTTLE OVER
PIPERACK OVER
FIRE STATION NO. 42
BOLTED PLATE OVER
SPARE TAILSHAFT
RUDDER STOCK
STAN
STEERING GEAR ROOM
FIRE STATION NO. 43
GIRDER OVER
PASSAGE
HATCH OVER
CARBINETS
FIRE STATION NO. 41
ROPE SCUTTLE OVER
CORDAGE SPACE
ALUMINUM GRATING 4" ABOVE DK
MACHINERY
SPACE
GRATING 8'-6" ABOVE BL (BY ENGRS)
FIRE STATION NO. 40
FIRE STATION NO. 39
GRATING (BY ENGRS)
OPENING IN UPPER DECK OVER
BOLTED PLT IN UPPER DK OVER
FLOOR PLATE
OPEN
LUBE OIL SETTLING TANK
LUBE OIL STORAGE TANK
ENGINEERS STOREROOM
FIRE STATION NO. 38
ENGINEERS STOREROOM
VENT
ELEV
ESCAPE TRUNK
DISTILLED WATER TANK
POTABLE WATER TANK
FIRE PUMP ROOM ACCESS TRUNK
FUEL OIL SETTLING TANK-PORT
PUMP ROOM ACCESS TRUNK
FUEL OIL SETTLING TANK-STBD
CENTER TANK NO. 8
CARGO OIL
2-COURSE RAIL 42" HIGH
SALT WATER BALLAST TANK-STBD
LOW SULPHUR FUEL OIL TANK
FUEL OIL TANK STBD
OPENING FOR TANK CLEANING MACHINE
TANK CLEANING OPENING OVER
78'-4" FLAT
24" FRAME SPACING
30" FRAME SPACING
LINE OF SHELL AT 78'-4" FLAT
LINE OF SHELL AT UPPER DECK OVER
LIGHTENED FLAT SUPPORTED OF 35'-0½" BHD (?) EXCEPT AS NOTED
30" FRAME SPACING
10'-5" FRAME SPACING
ELEV
ESCAPE TRUNK
CROSSOVER PLATE
HATCHWAY IN CAMBER DK OVER
HATCHWAY IN UPPER DK OVER
PLAN AT 94'-4" LEVEL - TOP OF WATER TANKS
WING TANK NO. 1-PORT CARGO OIL
FORE PEAK TANK SALT WATER BALLAST
CHAIN LOCKER
PASSAGE
CENTER TANK NO. 1
FORE PEAK TANK
SALT WATER BALLAST
CARGO OIL
CHAIN LOCKER
FORE PEAK TANK SALT WATER BALLAST
WING TANK NO. 1-STBD CARGO OIL
LIGHTENED FLAT EXCEPT AS NOTED
19'-1" FRAME SPACING
24" FRAME SPACING

0100.917

MICRO-MASTER 105 mm

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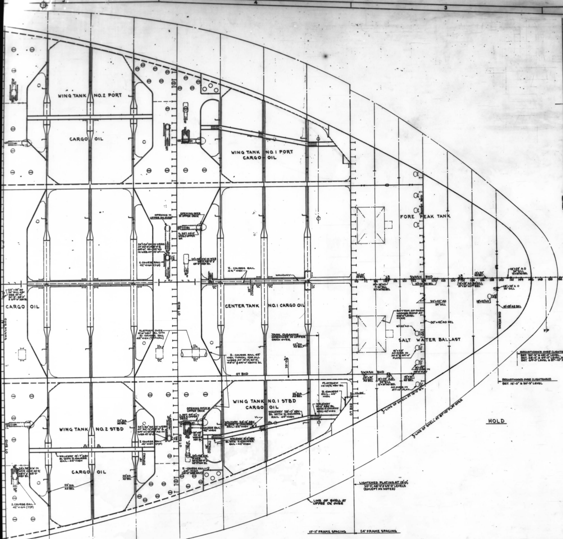
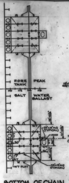
SEPT. '80

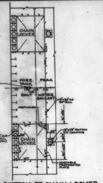
10X

FRAME 2


WING TANK NO. 2 PORT
CARGO OIL
WING TANK NO. 1 PORT
CARGO OIL
FORE PEAK TANK
CARGO OIL
CENTER TANK NO. 1 CARGO OIL
SALT WATER BALLAST
WING TANK NO. 1 STBD
CARGO OIL
WING TANK NO. 2 STBD
CARGO OIL
SWASH BHD
OT BHD
CL SHIP
FP
HOLD
2-COURSE RAIL 42" HIGH (TYP)
TANK CLEANING OPENINGS IN UPPER DECK OVER
BREASTHOOKS OVER (LIGHTENED)
LIGHTENED PLATING AT 15'-0", 30'-3", 45'-0" & 69'-0" LEVELS (EXCEPT AS NOTED)
LINE OF SHELL AT UPPER DK OVER
17'-11" FRAME SPACING
24' FRAME SPACING



BOTTOM OF CHAIN LOCKER SUMP
66'-0" ABOVE BASELINE



BOTTOM OF CHAIN LOCKER
69'-0" ABOVE BASELINE

		REVISIONS	NNS&DD CO		OWNER	
REV	ZONE	DESCRIPTION	DATE	AUTH	DATE	APPD
A		INITIAL ISSUE	11/13/75	AC		
B	2-C' 3-B'	1. AFT BHD OF CHAIN LOCKER FRS 109-116 P/S RELOCATED FROM FR 109 TO 30" FWD OF FR 109 TO SEGREGATE CHAIN LOCKERS FROM CARGO OIL TANK AS REQUIRED BY U S COAST GUARD REGULATIONS. THE FOLLOWING REVISIONS MADE TO SUIT: STIFFENERS ON TRANSV BHD FR 109 RELOCATED FROM AFT TO FWD SIDE OF BHD INBD OF LONG. BHD 39'-0⅝" OFF CL P/S ABOVE THE 69'-0" FLAT. BOTTOM OF CHAIN LOCKER RELOCATED FROM 72'-0" TO 69'-0" ABOVE BL & BOTTOM OF CHAIN LOCKER SUMP RELOCATED FROM 69'-0" TO 66'-0" ABV BL. ACCESS INTO CHAIN LOCKER SUMP REVISED & RELOCATED.				
	3-B'	2. STIFFENERS ON TRANSV BHD FR 124 RELOCATED FROM AFT TO FWD SIDE OF BHD TO SUIT DESIGN DEVELOPMENT.				
	7-B' 7-C'	3. INDICATION OF HATCH IN UPPER DECK OVER FRS 92-93 RELOCATED FROM 22'-6" TO 16'-6" OFF CL PORT & IL IN WAY OF SAME REORIENTED FROM UP OUTBD TO UP INBD. INDICATION OF HATCH IN UPPER DECK OVER FRS 93-94 PORT IN WAY OF WING TANK NO. 4 RELOCATED FROM 10'-0" TO 11'-6" FWD OF FR 93. ALL TO SUIT ADDITION OF HELICOPTER LANDING AREA ON UPPER DECK AS AUTHORIZED BY CHANGE NO. 19 OF 4-5-76.				
	9-C'	4. 25" DIA ACCESS OPENING IN TRANSV WEB FR 82, 83 & 84 RELOCATED FROM 28'-6" TO 28'-0" OFF CL PORT TO CLEAR CARGO TANK PIPING.	EP C.	6/14/76	AC	
C	GEN	1. INDICATION OF TANK CLEANING OPENINGS OVER MODIFIED THROUGHOUT TO AGREE WITH REF NO. 5.				
	4A' 4D'	2. WEB 15'-0" ABV BL BETWEEN FRS 104-109 OUTBD OF BHD 39'-0⅝" OFF CL P/S MODIFIED AND HATCHWAY IN SAME ON FWD SIDE OF BHD FR 105 RELOCATED FROM ABOUT 72'-6" TO 60'-6" OFF CL P/S TO SUIT STRUCTURAL DEVELOPMENT AS SHOWN ON DWG NO. 1040-646.				
	GEN	3. HEIGHTS & LOCATION OF WALKWAYS IN WING TANK NO. 1-7 P/S MODIFIED TO SUIT DEVELOPMENT AS SHOWN ON DWG NO. 3300-199.				
	3B'	4. STIFFENERS ON TRANSV BHD FR 124 RELOCATED FROM FWD TO AFT SIDE OF BHD TO SUIT STRUCTURAL DEVELOPMENT AS SHOWN ON DWG NO. 1040-620.				
	3C'	5. STIFFENERS ON CL SWASH BHD FWD OF FR 109 RELOCATED FROM PORT TO STBD SIDE OF BHD AND ACCESS OPENINGS IN BHD MODIFIED TO SUIT STRUCTURAL DEVELOPMENT AS SHOWN ON DWG NO. 1030-478.				
	3B'	6. SILL OF ACCESS OPENING IN TRANSV SWASH BHD FR 139 P/S ALTERED FROM 24" TO 36" TO SUIT DESIGN DEVELOPMENT AS SHOWN ON DWG NO. 1030-467.				
	3B' 3C'	7. INDICATION OF ACCESS OPENINGS BELOW IN LONG. SWASH BHD 39'-0⅝" OFF CL P/S FRS 109-124 ALTERED FROM 16"×25" TO 18"×30" AND ACCESS OPENING IN SAME FRS 116-117 P/S ALTERED FROM 18" DIA TO 18"×25"×36" SILL. ALL TO IMPROVE ACCESS.				
	10C' 10D'	8. 18"×25" ACCESS OPENING & VL BELOW IN WEB 15'-0" ABOVE BL ABOUT 45" FWD OF FR 81 RELOCATED FROM 64'-0" TO 70'-0" OFF CL P/S TO CLEAR PIPING BELOW.				
	4A' 4D'	9. INDICATION OF ONE-COURSE RAIL 36" HIGH ADDED ON WEB 15'-0" ABOVE BL BETWEEN FRS 105½-109 P/S ADJACENT TO SHELL TO SUIT OWNER'S LETTER NO. 1122V OF 10-6-76.				
	2C'	10. SILL OF ACCESS OPENING FRS 112-115 IN CL LONG. BHD ALTERED FROM 36" TO 45½" ABOVE 69'-0" FLAT TO SUIT STRUCTURAL DEVELOPMENT AS INDICATED ON DWG NO. 1030-479.	JB C.	11/29/76	AC	LET 4-1366V OF 1-26-77
D	2D'	1. FOOTHOLDS FOR ACCESS TO CHAIN LOCKER FR 116 P/S REVISED TO SUIT DESIGN DEVELOPMENT AND AS INDICATED ON DWG NO. 1040-671.				
	3A' 4A' 5A'	2. HEIGHT OF WALKWAY IN WING TANK NO. 2, 3, 4, 5, 6 & 7 ALTERED FROM 15'5" TO 15'7" ABOVE BL TO SUIT DETAIL DEVELOPMENT AS INDICATED ON DWG NO. 3300-199.				
	4A' 4D'	3. SHELL LONG. FRS 107-109 P/S REVISED TO SUIT DETAIL DEVELOPMENT AS INDICATED ON DWG NO. 1000-175.				
	4A' 4D'	4. PLATFORM ADDED 14'10½" ABOVE BL FRS 108⅝-109 IN WAY OF SHELL LONG P/S TO IMPROVE ACCESS AND AS SHOWN ON DWG NO. 3300-199.				
	GEN	5. RAILS IN WAY OF WALKWAYS, PLATFORMS, HORIZONTAL GIRDERS & CVK ALTERED FROM 1-COURSE 36" HIGH TO 2-COURSE 42" HIGH TO AGREE WITH DWG NO. 3300-212.				
	4B' 3B'	6. WALKWAY IN WAY OF CVK ALTERED FROM 18" TO 27" WIDE TO IMPROVE ACCESS AND AS SHOWN ON DWG NO. 3300-201.				
	10B'	7. INDICATION OF ACCESS OPNG BELOW IN TRANSV BHD FR 81 RELOCATED FROM 16'6" TO 13'6" OFF CL STBD TO IMPROVE ACCESS IN WAY OF CARGO PIPING & AS INDICATED ON DWG NO. 1060-679.	JBC		1-9-78	LET NO 1730V OF 4-4-78
E	GEN'L	1. RAILS ADDED IN WAY OF SECONDARY ACCESS HATCHWAYS IN WEB AT 15'-0", 30'-3", 45'-0" AND 69'-0" ABOVE BL THRUOUT CARGO SECTION TO SUIT US COAST GUARD REQUIREMENTS FOR RAIL PROTECTION IN WAY OF OPENINGS. THIS IS PART OF N N CHANGE NO. 141.				
	GEN'L	2. RAILS INDICATED IN WAY OF PRIMARY ACCESS HATCHWAYS IN WEB AT 15'-0" ABOVE BL IN CARGO WING TANKS THRUOUT TO AGREE WITH DWG NO 3300-201	EHR C.		1-27-79	

AUTHORITY:

GENERAL NOTES:
1. THIS PLAN SUPERSEDES AND REPLACES DWG NO. 0100-798 FOR HULLS NO. 613C & 614C.

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS BLUELINE PRINTS FROM AN AUTO-POSITIVE ~ CHARGE TO 613C-10079
DATE ______ SIGNED A. Cowling

ABBREVIATIONS

ABT	ABOUT
ABV	ABOVE
AO	ACCESS OPENING
BEL	BELOW
BET	BETWEEN
BHD	BULKHEAD
BL	BASE LINE
CL	CENTER LINE
DIA	DIAMETER
DK	DECK
DN	DOWN
FP	FORWARD PERPENDICULAR
FR	FRAME
FWTMH	FLUSH WATERTIGHT MANHOLE HINGED
HW	HATCHWAY
IL	INCLINED LADDER
LKR	LOCKER
LR	LADDER RUNG
MHO	MANHOLE OVER
NO	NUMBER
NT	NON-TIGHT
OT	OIL TIGHT
STBD	STARBOARD
VL	VERTICAL LADDER
WL	WATERLINE
WT	WATERTIGHT

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS
OWNERS LETTER OF 1-26-76
USPH LETTER OF 1-30-75
USCG LETTER 8940/NNS&DD CO HULLS 613-616 OF 12-15-75

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING DEPT.

KEY PLAN

SCALE ⅛ INCH = 1 FT
DRAWN E. PARKMAN
CHECKED J. B. CORUM, JR.
SECT MGR A. Cowling
DATE COMPL. 10/13/75
EXAMINED
AUTHORIZED
DATE 10-13-75
TECH APPROVAL R M Shier
CSD APPROVAL R. L. Harrington

NO.	REFERENCES	DWG NO.
8	NAV BRIDGE & HOUSE TOP-GENERAL ARRGT.	0100-778
7	ACCOMMODATIONS GENERAL ARRGT-IN DECK HOUSE	0100-774
6	UPPER DK AFT OF FR 81- GENERAL ARRANGEMENT	0100-909
5	UPPER DK FWD OF FR 81-GENERAL ARRANGEMENT	0100-908
4	SECOND DK FWD & 78'-4" FLAT AFT-GENERAL ARRGT	0100-917
3	33'-0" & 60'-0" FLAT AFT-GENERAL ARRANGEMENT	0100-770
2	HOLD AFT OF FR 81-GENERAL ARRANGEMENT	0100-920
1	HOLD FWD OF FR 81-GENERAL ARRANGEMENT	0100-919

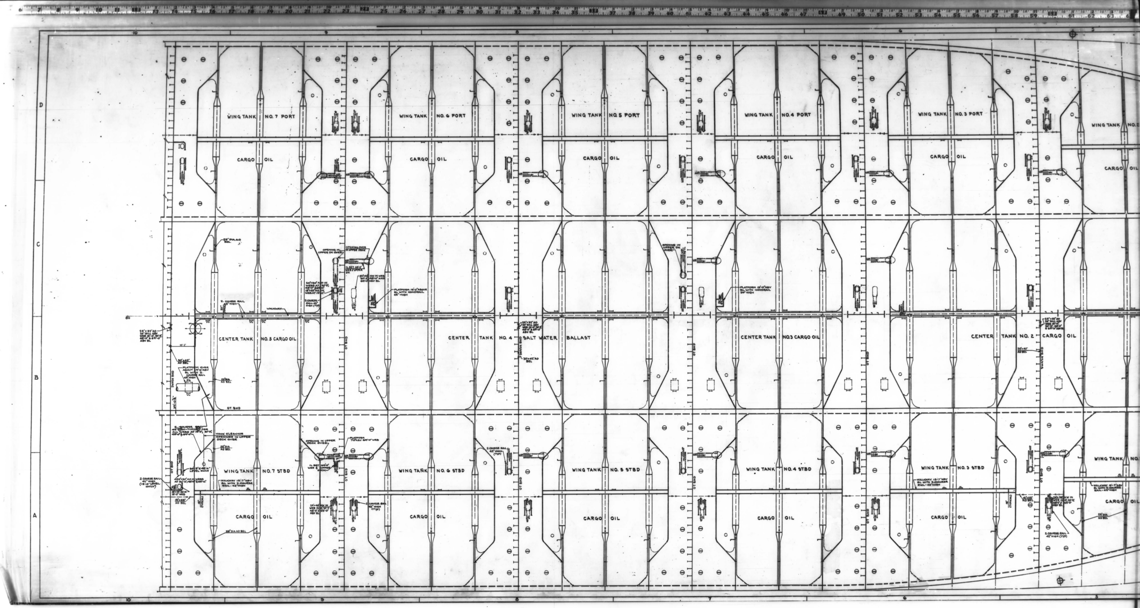
390,000 DWT TANKER
HOLD FORWARD OF FRAME 81
GENERAL ARRANGEMENT

USMA DESIGN T11-S-119a
~~USMA DWG NO.~~
HULL NO. 309 & 310
DWG NO. 0100-919
SEE NOTE NO. 1
REV E
SHEET NO. 1 OF 1

0100-919

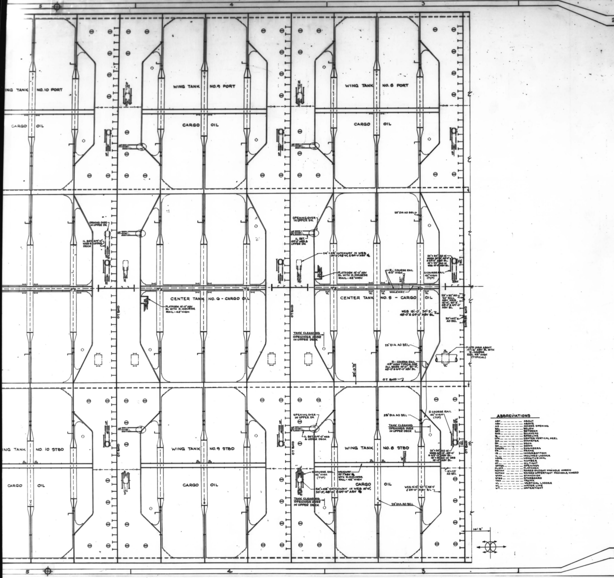
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
10X
FRAME 1


WING TANK NO. 7 PORT
WING TANK NO. 6 PORT
WING TANK NO. 5 PORT
WING TANK NO. 4 PORT
WING TANK NO. 3 PORT
CARGO OIL
CENTER TANK NO. 5 CARGO OIL
CENTER TANK NO. 4 SALT WATER BALLAST
CENTER TANK NO. 3 CARGO OIL
CENTER TANK NO. 2 CARGO OIL
WING TANK NO. 7 STBD
WING TANK NO. 6 STBD
WING TANK NO. 5 STBD
WING TANK NO. 4 STBD
WING TANK NO. 3 STBD
WALKWAY
OT BHD
SWASH BHD
2 COURSE RAIL 42" HIGH
OPENING IN UPPER DK OVER
PLATFORM 15'-0" ABV BL WITH HANDRAIL 42" HIGH
TANK CLEANING OPENINGS IN UPPER DECK OVER
25" DIA AO BEL
10
9
8
7
6
5
D
C
B
A

0100-919

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
10X
FRAME 2


5
4
3
2
1
WING TANK NO. 10 PORT
WING TANK NO. 9 PORT
WING TANK NO. 8 PORT
CARGO OIL
CARGO OIL
CARGO OIL
CENTER TANK NO. 6 - CARGO OIL
CENTER TANK NO. 5 - CARGO OIL
WALKWAY
OT BHD
WING TANK NO. 10 STBD
WING TANK NO. 9 STBD
WING TANK NO. 8 STBD
CARGO OIL
CARGO OIL
CARGO OIL
OPENING OVER IN UPPER DK
OPENING OVER IN UPPER DK
IL DET 64'-0" WEB & UPPER DECK
PLATFORM 15'-0" ABV BL WITH 2-COURSE RAIL - 42" HIGH
24"x48" HATCHWAY IN WEB 30'-3", 48'-0" & 69'-0" ABV BL
PLATFORM 15'-0" ABV BL WITH 2-COURSE RAIL - 42" HIGH
2-COURSE RAIL 42" HIGH
2 COURSE RAIL 42" HIGH (TYP)
25" DIA AO BEL
TANK CLEANING OPENINGS OVER IN UPPER DECK
30"x42" AO BEL
25" DIA AO BEL
2-COURSE RAIL 42" HIGH TYPICAL FOR ALL WEBS 15'-0", 30'-3", 48'-0" & 69'-0" ABV BL
PLATE OVER ABOUT 17'-0" ABV BL WITH 2-COURSE RAIL 42" HIGH (TYPICAL)
OT BHD
25" DIA AO BEL
TANK CLEANING OPENINGS OVER IN UPPER DECK
2 COURSE RAIL 42" HIGH (TYP)
TANK CLEANING OPENINGS OVER IN UPPER DECK
24"x48" HATCHWAY IN WEB 15'-0", 30'-3", 48'-0" & 69'-0" ABV BL
WALKWAY 2-COURSE RAIL - 42" HIGH
WEB 15'-0", 30'-3", 48'-0" & 69'-0" ABV BL
25" DIA AO BEL
10'-2"
D
C
B
A

ABBREVIATIONS

ABT	ABOUT
ABV	ABOVE
AO	ACCESS OPENING
BEL	BELOW
BET.	BETWEEN
BHD	BULKHEAD
BL	BASELINE
CVK	CENTER VERTICAL KEEL
DIA	DIAMETER
DK	DECK
DN	DOWN
ENGRS	ENGINEERS
FR	FRAME
IB	INNERBOTTOM
IL	INCLINED LADDER
LONG.	LONGITUDINAL
NO.	NUMBER
OT	OILTIGHT
OPNGS	OPENINGS
PLATF	PLATFORM
ROTMH	RAISED OILTIGHT MANHOLE HINGED
RWTMH	RAISED WATERTIGHT MANHOLE HINGED
STAN	STANCHION
STBD	STARBOARD
TRK	TRUNK
VL	VERTICAL LADDER
WL	WATER LINE
WT	WATERTIGHT

REVISIONS

REV	ZONE	DESCRIPTION		NNS & DD CO DATE	AUTH	OWNER DATE	APPD
A	1.	INITIAL ISSUE.					
B	1. 6-C'	18"x23" ACCESS OPENING IN HORIZONTAL WEB 15'-0" ABOVE BL ON AFT SIDE OF TRANSV BHD FR 63 AT 10'-6" OFF CL PORT DELETED & VERTICAL LADDER BELOW IN WAY OF SAME RELOCATED TO ABT 30' FWD OF FR 64 PORT ADJACENT TO CVK RIDER PLATE. ALL TO CLEAR CARGO TANK PIPING BELOW.					
	2. 7-A' 7-B' 7-C'	CENTER TANK NO. 6 ALTERED FROM CARGO OIL OR SLOP TO CARGO OIL & WING TANK NO. 12 P/S ALTERED FROM CARGO OIL TO CARGO OIL OR SLOP TO SUIT CHANGE NO. 76 OF 4-1-76.					
	3. 7-A' 7-D'	18"x23" ACCESS OPENING IN HORIZONTAL WEB 15'-0" ABV BL ON AFT SIDE OF TRANSV BHD FR 61 AT 58'-6" OFF CL P/S ROTATED 90° & VERTICAL LADDER BELOW IN WAY OF SAME RELOCATED FROM FWD TO INBD SIDE OF ACCESS OPENING TO IMPROVE ACCESS AS REQUESTED BY OWNERS.					
	4. 7-A' 7-D'	PLATFORM 16'-3" ABOVE BL FRS 61-62 OUTBD OF LONG. BHD 35'-0" P/S OFF CL P/S REVISED. PLATFORM ABOUT 70'-0" ABOVE BL FRS 61-62 IN WAY OF INCLINED LADDER ACCESS FROM UPPER DECK TO WING TANK NO. 12 P/S REVISED & DOWN INCLINED LADDER ADDED IN WAY OF HATCHWAY IN WEB OVER 48'-0" & 69'-0" ABV BL. ALL TO IMPROVE ACCESS TO WING TANK NO. 12 P/S.					
	5. 7-B' 7-C'	BRACKETS IN WAY OF HORIZONTAL GIRDER 15'-0" ABOVE BL OUTBD OF LONG. BHD 35'-0" P/S OFF CL P/S REVISED TO AGREE WITH DWG. NO. 1040-632.					
	6. 8-B' 8-C'	ACCESS IN CARGO PUMP ROOM ADDED TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG. NO. 6650-261. RESERVATION NO. 1 RELEASED TO SUIT.					
	7. 8-B' 8-C'	VERTICAL LADDER ON FWD SIDE OF TRANSV BHD FR 58 P/S RELOCATED FARTHER OUTBD & FWD TO SUIT DEVELOPMENT AS INDICATED ON DWG NO. 3500-159.					
	8. 8-B' 8-C'	VERTICAL STIFFENER ON TRANSV WEB FR 59 ABOUT 18'-0" OFF CL P/S RELOCATED FROM FWD TO AFT SIDE OF WEB TO SUIT DWG NO. 1030-529.					
	9. 8-B' 8-C'	VERTICAL LADDER BELOW IN WAY OF MANHOLE FRS 53-54 STBD & FRS 55-56 ABOUT 16'-3" OFF CL P/S DELETED AS NOT REQUIRED FOR ACCESS.					
	10. 8-C'	MANHOLE FRS 56-57 RELOCATED FROM 21" OFF CL PORT TO 30" OFF CL STBD TO SUIT DESIGN DEVELOPMENT OF MACHINERY SPACE ARRANGEMENT AS REQUESTED BY OUR MACHINERY GROUP					
	11. 8-C'	INDICATION OF ACCESS TRUNK OVER FRS 56-58 PORT IN WAY OF FIRE PUMP ROOM INCREASED IN SIZE TO AGREE WITH REF NO. 5.	EP G.	6/8/76	AC	LET. 1011V OF 7-29-76	
C	1. GEN	HEIGHT & LOCATION OF FORE & AFT WALKWAY IN WING TANK NO. 5 TO NO. 12 INCLUSIVE REVISED TO SUIT DEVELOPMENT AS SHOWN ON DWG NO. 3500-199.					
	2. GEN	INDICATION OF TANK CLEANING OPENINGS OVER MODIFIED THROUGHOUT TO AGREE WITH REF NO. 14.					
	3. 6A' 7D'	INDICATION OF VL BELOW RELOCATED FROM JUST AFT OF FR 65 ABOUT 67'-6" OFF CL P/S TO ADJACENT TO WALKWAY ABOUT FR 64½ P/S TO CLEAR HEATING COILS BELOW AS REQUESTED BY OUR PIPING ENGRS. 18"x23" AO IN HORIZONTAL WEB IN WAY OF SAME DELETED TO SUIT.					
	4. 8B' 8C' 9C'	WALKWAY WITH 36" HANDRAIL & VERTICAL LADDERS IN WAY OF SAME ADDED IN FUEL OIL TANK BETWEEN FRS 58-60½ P/S. MANHOLE 36" OFF CL PORT BETWEEN FRS 24-25 REHINGED FROM AFT TO FWD. ALL TO IMPROVE ACCESS.					
	5. 10B'	ACCESS OPENINGS ADDED IN FLOOR FRS 17 & 18 TO SUIT STRUCTURAL DEVELOPMENT AS SHOWN ON DWG NO. 1030-488. INACCESSIBLE VOID AFT OF FR 18 DELETED TO SUIT.					
	6. 7B' 7C'	SIZE & SILL HEIGHT FOR ARCHES IN TRANSV WEB FR 38 & 41 P/S ALTERED TO SUIT STRUCTURAL DEVELOPMENT AS SHOWN ON DWG NO. 1050-469.					
	7. 8B' 8C' 9C'	FIRE STATION ADDED BETWEEN FRS 29-30 PORT, FRS 46-47 STBD AND FRS 50-51 PORT TO SUIT DEVELOPMENT OF FIREMAIN SYSTEM AS SHOWN ON DWG NO. 2400-1020.					
	8. 7A' 7D'	PLATFORM WITH 36" HANDRAIL ADDED AT 16'-3" ABV BL BETWEEN FRS 61½-62½ ABOUT 58'-6" OFF CL P/S TO SUIT OWNER'S LET. NO. 1011V OF 7-29-76.					
	9. 6A' 6D'	ONE-COURSE RAIL 36" HIGH ADDED BETWEEN FRS 64-66 P/S ADJACENT TO SHELL TO SUIT OWNER'S LETTER NO. 1094V OF 9-21-76.	JB C.	3/17/77	AC	LET. NO. 1532V OF 3-22-77	
D	1. GEN'L	RAILS IN WAY OF WALKWAYS, PLATFORMS, HORIZONTAL WEBS & CVK ALTERED FROM 1-COURSE 36" HIGH TO 2-COURSE 42" HIGH TO AGREE WITH DWG NO. 3300-215.					
	2. 3C'	WALKWAY IN WAY OF CVK ALTERED FROM 18" TO 27" WIDE TO IMPROVE ACCESS & AS INDICATED ON DWG NO. 3300-241.					
	3. 7B'	INDICATION OF TANK CLEANING OPENING IN UPPER DECK OVER ABOUT 25'-6" OFF CL STBD RELOCATED FROM FRS 64-65 TO FRS 61-62 TO AGREE WITH REF 14.					
	4. 7D'	INDICATION OF PLATFORM OVER 48'-0" ABOVE BL ADDED FRS 61-62 PORT ADJACENT TO CL TO SUIT OWNERS LETTER NO. 1532V OF 3-22-77.					
	5. 7A' 7D'	WALKWAY IN WING TANK NO. 12 BETWEEN FRS 62-64 P/S REVISED AND VERTICAL LADDERS IN WAY OF SAME RELOCATED. ALL TO CLEAR HEATING COILS IN TANK.					
	6. 8B' 8D'	WALKWAY IN FUEL OIL TANK FRS 58-60 P/S REVISED AND RELOCATED TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 3300-199. VERTICAL LADDERS IN WAY OF WALKWAY REVISED TO SUIT.					
	7. 8B' 8C'	12" DIA ACCESS OPENING IN FLOOR FR 48 ABOUT 29'-3" OFF CL P/S DELETED & 18" DIA. ACCESS OPENING ADDED FRS 47-48 IN LONG GIRDER 28'-0" OFF CL P/S TO IMPROVE ACCESS.					
	8. 9B'	ACCESS OPENING ADDED IN FLOOR FR 29 P/S ADJACENT TO CL TO AGREE WITH DWG NO. 1010-160.	JBC		3-9-78	LET. NO. 1960V OF 4-4-78	
E	1. 7A' 7D'	PLATFORM FRS 61-62 ABOUT 48'-6" AND ABOUT 58'-6" OFF CL P/S RELOCATED FROM 16'-3" TO 16'-6¼" ABOVE BL. PLATFORM FRS 61-62 ABOUT 66'-3" OFF CL P/S RELOCATED FROM 15'-0" TO 16'-0" ABOVE BL. ALL TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 3300-199.					
	2. 8D' 8C'	ACCESS OPENING IN LONGITUDINAL GIRDER ABOUT 28'-6" OFF CL P/S BET FRS 47-48 ALTERED FROM 18" DIA. TO 15"x18". ACCESS OPENING IN LONGITUDINAL GIRDER ABOUT 34'-3" OFF CL STBD FRS 55-56 ALTERED FROM 12" DIA. TO 12"x18". 18" DIA. ACCESS OPENING ADDED IN LONGITUDINAL GIRDER ABOUT 18'-0" OFF CL BETWEEN FRS 55-56 & FRS 53-54 P/S AND IN LONGITUDINAL GIRDER ABOUT 27'-6" OFF CL PORT BETWEEN FRS 53-54. ALL TO IMPROVE ACCESS IN INNERBOTTOM AND AS INDICATED ON DWG NO. 1010-168.					
	3. GEN'L	RAILS ADDED IN WAY OF SECONDARY ACCESS HATCHWAYS IN WEBS AT 15'-0", 30'-3", 48'-0" AND 69'-0" ABOVE BL THRUOUT CARGO SECTION TO SUIT U.S. COAST GUARD REQUIREMENTS FOR RAIL PROTECTION IN WAY OF OPENINGS. THIS IS PART OF N.N. CHANGE NO. 141.					
	4. GEN'L	RAILS INDICATED IN WAY OF PRIMARY ACCESS HATCHWAYS IN WEB AT 15'-0" ABOVE BL IN CARGO WING TANKS THRUOUT TO AGREE WITH DWG NO. 3500-201	R C.		11-27-78		

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN SUPERSEDES & REPLACES DWG NO. 0100-769 FOR HULLS NO. G13C & G14C.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
G14C	310	
G13C	309	

APPROVALS

OWNERS LETTER OF 3-1-76

USPH LETTER OF 1-16-76

USCG LET. [illegible] NNS&DD HULLS G13-G15 OF 1-16-76

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPARTMENT
FSCM NO. 43689

KEY PLAN

SCALE 1/8" = 1 FT
DRAWN J.D. BENTON, JR.
CHECKED J. B. CORBUM, JR.
SECT MGR A. Conley
DATE COMPL 12-18-75
EXAMINED
AUTHORIZED
DATE 12-18-75
TECH APPROVAL R Shea 12/18/75
C S D APPROVAL R. Harrington

390,000 DWT TANKER
HOLD AFT OF FRAME 81
GENERAL ARRANGEMENT

USMA DESIGN T11-S-116a
HULL NO. 309 & 310
DWG NO. 0100-920 (SEE NOTE NO. 1)
REV E
SHEET NO. 1 OF 1

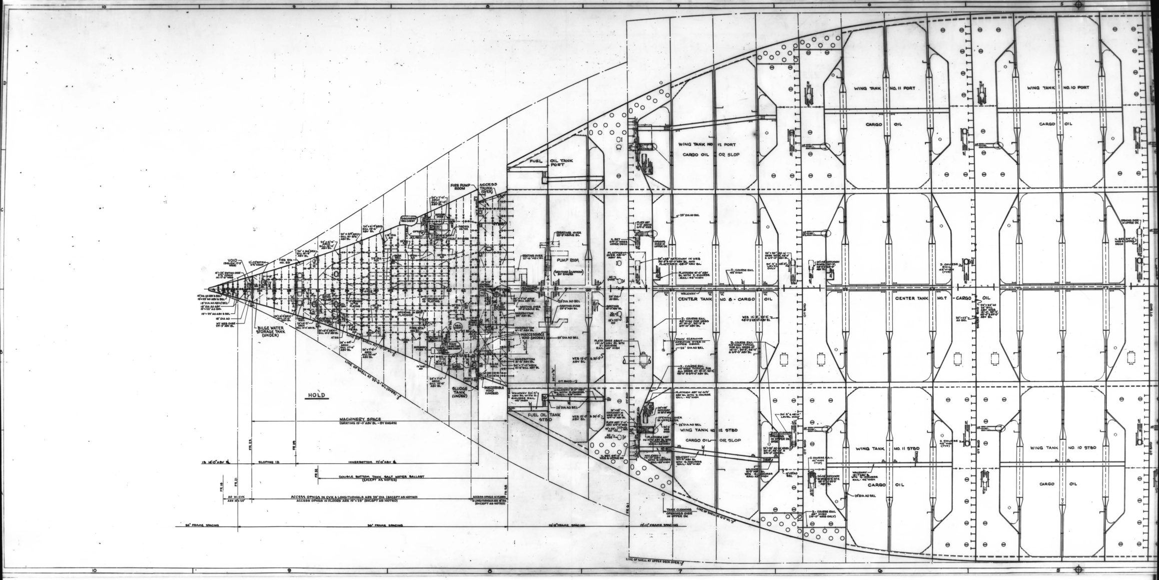
NO.	REFERENCES	DWG NO.
8	NAV BRIDGE & HOUSE TOP GENERAL ARRANGEMENT	0100-778
7	ACCOMMODATIONS GEN'L ARRGT IN DECK HOUSE	0100-774
6	UPPER DK AFT OF FR 81 GENERAL ARRANGEMENT	0100-909
5	UPPER DK FWD OF FR 81 GENERAL ARRANGEMENT	0100-908
4	SECOND DK FWD & 78'-4" FLAT AFT GENERAL ARRANGEMENT	0100-917
3	35'-0" & 60'-0" FLAT AFT GENERAL ARRANGEMENT	0100-770
2	HOLD AFT OF FR 81 GENERAL ARRANGEMENT	0100-920
1	HOLD FWD OF FR 81 GENERAL ARRANGEMENT	0100-919

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS BLUELINE PRINTS FROM AN AUTO-POSITIVE ~ CHARGE TO G13C-10079
DATE SIGNED A. Conley

GROUP: MC NO.

0100 - 920

SEPT. '80
10X
FRAME 1


10
9
8
7
6
5
WING TANK NO. 11 PORT
CARGO OIL
WING TANK NO. 10 PORT
CARGO OIL
WING TANK NO. 12 PORT
CARGO OIL OR SLOP
FUEL OIL TANK PORT
FIRE PUMP ROOM
ACCESS TRUNK (OVER)
PUMP ROOM
CENTER TANK NO. 8 - CARGO OIL
CENTER TANK NO. 7 - CARGO OIL
VOID
BILGE WATER STORAGE TANK (UNDER)
SLUDGE TANK (UNDER)
INACCESSIBLE VOID (UNDER)
HOLD
FUEL OIL TANK STBD
WING TANK NO. 12 STBD
CARGO OIL OR SLOP
WING TANK NO. 11 STBD
CARGO OIL
WING TANK NO. 10 STBD
CARGO OIL
LINE OF SHELL AT 33'-0" WL (OVER)
MACHINERY SPACE
(GRATING 15'-0" ABV BL - BY ENGRS)
FR 23
FR 29
FR 32
FR 18
FR 21
FR 55
FR 61
IB 14'-0" ABV BL
SLOPING IB
INNERBOTTOM 12'-0" ABV BL
DOUBLE BOTTOM TANK SALT WATER BALLAST
(EXCEPT AS NOTED)
AO IN CVK
ARE 15"x25"
ACCESS OPNGS IN CVK & LONGITUDINALS ARE 25" DIA (EXCEPT AS NOTED)
ACCESS OPNGS IN FLOORS ARE 15"x25" (EXCEPT AS NOTED)
ACCESS OPNGS IN FLOORS & LONGITUDINALS ARE 15" DIA (EXCEPT AS NOTED)
24" FRAME SPACING
30" FRAME SPACING
10'-8" FRAME SPACING
17'-11" FRAME SPACING
TANK CLEANING OPENINGS OVER IN UPPER DK
LINE OF SHELL AT UPPER DECK OVER

0100 - 920

MICRO-MASTER® 105 mm

K+E

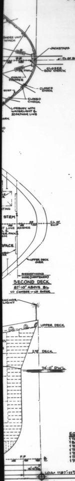
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

KEUFFEL & ESSER CO.

SEPT. '80

10X

FRAME 2



CAPACITIES & CENTERS OF GRAVITY

CARGO OIL		CAPACITY - BBLS		CENTERS OF GRAVITY	
FRAMES	TANK	100% FULL	98% FULL	ABOVE BL	AFT OF FP
105-109	CENTER No. 1	97422	95474	49.32	115.85
97-105	CENTER No. 2	194638	190745	49.30	223.34
93-97	CENTER No. 3	97163	95220	49.30	330.83
77-85	CENTER No. 5	193615	189743	49.30	581.67
73-77	CENTER No. 6	96967	95028	49.30	689.17
65-73	CENTER No. 7	193985	190105	49.30	796.67
59-65	CENTER No. 8	119563	117191	53.95	914.00
105-109	WING No. 1 PORT	56358	55231	53.81	119.55
105-109	WING No. 1 STARBOARD	56358	55231	53.81	119.55
101-105	WING No. 2 PORT	81314	79687	50.70	188.63
101-105	WING No. 2 STARBOARD	81314	79687	50.70	188.63
97-101	WING No. 3 PORT	89757	87962	49.00	259.37
97-101	WING No. 3 STARBOARD	89757	87962	49.00	259.37
93-97	WING No. 4 PORT	91193	89369	48.40	330.86
93-97	WING No. 4 STARBOARD	91193	89369	48.40	330.86
89-93	WING No. 5 PORT	91279	89453	48.35	402.50
89-93	WING No. 5 STARBOARD	91279	89453	48.35	402.50
85-89	WING No. 6 PORT	91279	89453	48.35	474.17
85-89	WING No. 6 STARBOARD	91279	89453	48.35	474.17
81-85	WING No. 7 PORT	91267	89442	48.35	545.83
81-85	WING No. 7 STARBOARD	91267	89442	48.35	545.83
77-81	WING No. 8 PORT	91279	89453	48.35	617.50
77-81	WING No. 8 STARBOARD	91279	89453	48.35	617.50
73-77	WING No. 9 PORT	91279	89453	48.35	689.17
73-77	WING No. 9 STARBOARD	91279	89453	48.35	688.17
69-73	WING No. 10 PORT	91153	89330	48.42	760.80
69-73	WING No. 10 STARBOARD	91153	89330	48.42	760.80
65-69	WING No. 11 PORT	88994	87214	49.32	832.18
65-69	WING No. 11 STARBOARD	88994	87214	49.32	832.18
61-65	WING No. 12 PORT	78864	77284	52.62	902.87
61-65	WING No. 12 STARBOARD	78840	77263	52.62	902.87
TOTAL		3061,381	3,000,147		

SALT WATER BALLAST		CAPACITY	CENTERS OF GRAVITY	
FRAME	TANK	100% FULL S.W. TONS	ABOVE BL	AFT OF FP
109 FWD	FOREPEAK	17,158.99	50.23	49.79
23 AFT	AFTER PEAK	3,274.13	67.28	1,122.09
85-93	CENTER No. 4	31,156.40	49.30	438.33
23-30	S.W. BALLAST PORT	3,639.99	75.43	1,048.60
23-47	S.W. BALLAST STARBOARD	3,211.82	77.51	1,052.62
32-58	DOUBLE BOTTOM	892.06	6.41	1,026.43
TOTAL		59,333.4		

FRESH WATER		CAPACITY	CENTERS OF GRAVITY	
FRAMES	TANK	100% FULL F.W. TONS	ABOVE BL	AFT OF FP
50-57	DISTILLED WATER	460.64	86.29	1,003.75
50-57	POTABLE WATER	162.11	86.29	1,003.75
TOTAL		622.75		

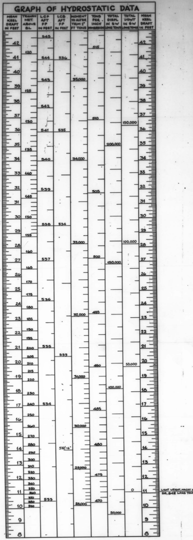
MISCELLANEOUS		CAPACITY - CUBIC FEET		CENTERS OF GRAVITY	
FRAMES	TANK	100% FULL	98% FULL	ABOVE BL	AFT OF FP
23-32	BILGE WATER STORAGE	4633	4540	7.05	1080.32
54-55	SLUDGE	182	179	8.97	1003.41
44-47	SEWAGE HOLDING	1837	1800	46.07	1027.60
TOTAL		6652	6519		

LUBE OIL		CAPACITY - GALLONS		CENTERS OF GRAVITY	
FRAMES	TANK	100% FULL	98% FULL	ABOVE BL	AFT OF FP
41-44	LUBE OIL STORAGE	11,020	10,800	85.41	1036.50
38-41	LUBE OIL SETTLING	10,938	10,719	85.41	1045.50
TOTAL		21,958	21,519		

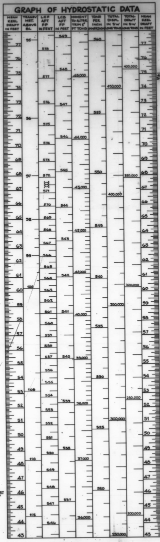
FUEL OIL		CAPACITY - BARRELS		CENTERS OF GRAVITY	
FRAMES	TANK	100% FULL	98% FULL	ABOVE BL	AFT OF FP
47-50	LOW SULFUR FUEL OIL	4340	4253	70.52	1018.44
47-50	DIESEL OIL	1672	1639	87.70	1018.47
50-61	FUEL OIL STORAGE PORT	54490	53400	61.20	972.81
50-61	FUEL OIL STORAGE STARBOARD	54490	53400	61.20	972.81
58-59	FUEL OIL SETTLING PORT	3340	3273	73.66	981.64
58-59	FUEL OIL SETTLING STARBOARD	3340	3273	73.66	981.64
TOTAL		121672	119238		

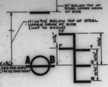
EQUIVALENTS:
1 TON = 2240 LBS
1 BARREL = 42 GALLONS
1 TON SALT WATER = 35 CUBIC FEET = 261.82 GALLONS
1 TON FRESH WATER = 36 CUBIC FEET = 269.30 GALLONS
1 TON FUEL OIL (15API) = 37.23 CUBIC FEET = 278.46 GALLONS = 6.63 BARRELS
1 TON LUBE OIL = 40.00 CUBIC FEET = 299.20 GALLONS = 7.124 BARRELS
1 TON DIESEL OIL = 41 CUBIC FEET = 306.68 GALLONS = 7.302 BARRELS

GRAPH OF HYDROSTATIC DATA



GRAPH OF HYDROSTATIC DATA




27" BELOW TOP OF STEEL UPPER DECK AT SIDE
17'-10 3/4" BELOW TOP OF STEEL UPPER DECK AT SIDE (NOT TO SCALE)
75'-0 5/16"
456,985 TONS DISPL
378,144.42 TONS DWT
A
B
TF
F
T
S
W

DIMENSIONS & DATA

LENGTH OVERALL	1187'-11 11/16"
LENGTH BETWEEN PERPENDICULARS	1143'-0"
BEAM-MOLDED	228'-0"
DEPTH-MOLDED - UPPER DECK AT SIDE	95'-0"
DEPTH-MOLDED - UPPER DECK AT CENTERLINE	99'-4"
DRAFT - SUMMER FREEBOARD - MOLDED	74'-11 1/4"
DESIGN DRAFT - MOLDED	74'-0"
DISPLACEMENT AT 74'-0" MOLDED DRAFT	450,684 LTSW
DISPLACEMENT AT FREEBOARD DRAFT 75'-0 5/16"	456,985 LTSW
PORT OF REGISTRY	NEW YORK, N.Y.
RADIO CALL LETTERS	WHNL
REGISTERED GROSS TONNAGE	189,416.92
REGISTERED NET TONNAGE	171,126
ABS SHAFT HORSEPOWER	45,000
SERVICE SPEED AT 90% ABS SHAFT HORSEPOWER & 74'-0" DESIGN DRAFT - KNOTS	15.9

UST PACIFIC

OFFICIAL NO. 613131

CAPACITY PLAN
— PREPARED BY —
NEWPORT NEWS SHIPBUILDING
NEWPORT NEWS, VIRGINIA
NOVEMBER 1979 J.D.C.

HULL NO.	DRAWING NO.
614C	0100-1152

REVISIONS						
REV.	SHEET	DESCRIPTION	NNS & DD CO. DATE	AUTH'D	OWNER DATE	APPD.
A		INITIAL ISSUE				

AUTHORITY:

GENERAL NOTES:

D

C

B

A

REPRODUCTION OFFICE
YARD PRINTS No GROUPING No
REMARKS CHARGE TO 614C - 10079
— SEE BELOW —
BLUELINE PRINTS FROM
A SEPIA
DATE 11-12-79 SIGNED D.A. Lester

YARD PRINTS

ORDERED BY DESIGN

GROUP: MC NO.

614C 310

SHIPS NAME

APPROVALS
OWNERS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPT.
FSCM NO. 43689

KEY PLAN

SCALE 1/16" = 1 FT
DRAWN J. D. Coquin, Jr.
CHECKED R.G.N.
SECT MGR D.A. Lester
DATE COMPL 11-12-79
EXAMINED
AUTHORIZED R. Cowley
DATE 11-12-79
TECH APPROVAL D.A. Lester 11-12-79
CSD APPROVAL

390,000 DWT TANKER

CAPACITY PLAN

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO. 310

DWG NO.	REV	SHEET NO.
0100-1152	A	1 OF 1

Hull Vault CSD

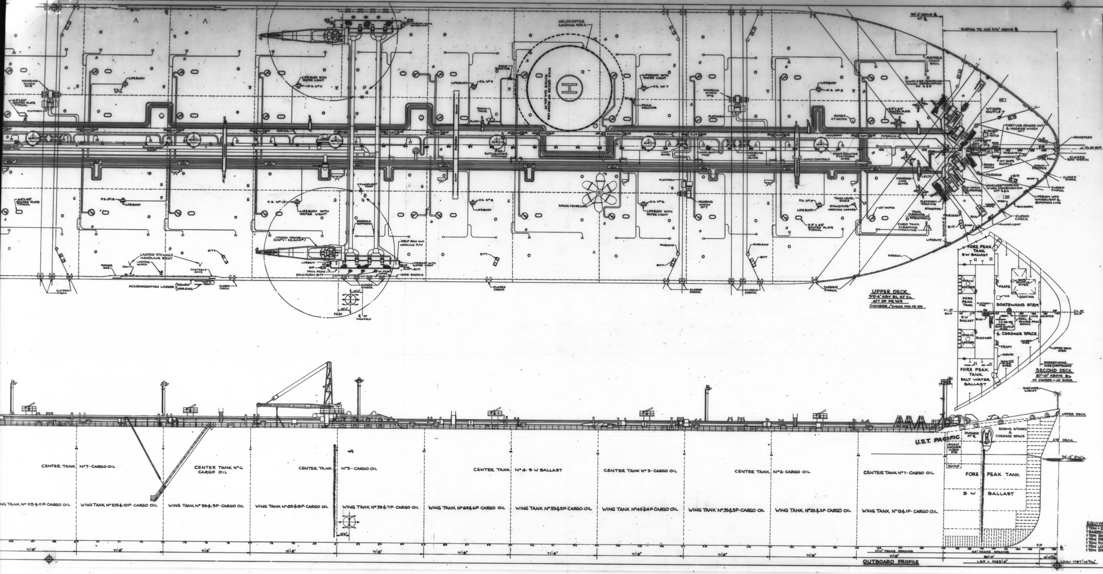
0100-1152

0100.1152

SEPT. '80

10X

FRAME 1


HELICOPTER LANDING AREA
H
MAX GROSS WT 20000 LBS ROTOR DIA 54 FT
LIFEBUOY WITH WATER LIGHT
MOORING WINCH
FOAM MONITOR
FLOODLIGHT MAST
FIRE EXTINGUISHER STOWAGE
WINDLASS/MOORING WINCH COMBINATION
FIRST LINE ASHORE UNIT & MOORING WINCH
JACKSTAFF
CL OF SHIP
CLOSED CHOCK
SPARE PROPELLER
CARGO CRANE (CAP'Y - 33,000#)
DRIP PAN AND WORKING PLTF
MANIFOLD SUPPORTS
HOSE SADDLE
CRUCIFORM BITT
LADDER STOWAGE HANDLING BRKT
ACCOMMODATION LADDER (STOWED) (WORKING)
PORTABLE GATE
SLOPING TO 103'-9¼" ABOVE ℄
99'-4" ABOVE ℄ AT ℄
PIPERAIL
UPPER DECK
99'-4" ABV BL AT CL
AFT OF FR 109
CAMBER / SHEER FWD FR 109
FORE PEAK TANK
SW BALLAST
CHAIN LOCKER
BOATSWAINS STRM
CORDAGE SPACE
PASSAGE
FORE PEAK TANK SALT WATER BALLAST
SECOND DECK
87'-10" ABOVE BL
NO CAMBER - NO SHEER
ANCHOR LIGHT
UPPER DECK
2nd DECK
34'-0" DWL
U.S.T. PACIFIC
BOSNS STORES & CORDAGE SPACE
CHAIN LOCKER
SUMP
FORE PEAK TANK
S W BALLAST
CENTER TANK N°7 - CARGO OIL
CENTER TANK N°6 CARGO OIL
CENTER TANK N°5 - CARGO OIL
CENTER TANK N°4 - S W BALLAST
CENTER TANK N°3 - CARGO OIL
CENTER TANK N°2 - CARGO OIL
CENTER TANK N°1 - CARGO OIL
WING TANK N°11S & 11P CARGO OIL
WING TANK N°10S & 10P - CARGO OIL
WING TANK N°9S & 9P - CARGO OIL
WING TANK N°8S & 8P - CARGO OIL
WING TANK N°7S & 7P - CARGO OIL
WING TANK N°6S & 6P - CARGO OIL
WING TANK N°5S & 5P - CARGO OIL
WING TANK N°4S & 4P - CARGO OIL
WING TANK N°3S & 3P - CARGO OIL
WING TANK N°2S & 2P - CARGO OIL
WING TANK N°1S & 1P - CARGO OIL
71'-8"
17'-11" FRAME SPACING
24" FRAME SPACING
OUTBOARD PROFILE
LBP = 1143'-0"
LOA = 1187'-11 13/16"

CAPACITIES

CARGO OIL	
FRAMES	TANK
105-109	CENTER No. 1
97-105	CENTER No. 2
93-97	CENTER No. 3
77-85	CENTER No. 5
73-77	CENTER No. 6
65-73	CENTER No. 7
59-65	CENTER No. 8
105-109	WING No. 1 PO
105-109	WING No. 1 STA
101-105	WING No. 2 PO
101-105	WING No. 2 STA
97-101	WING No. 3 PO
97-101	WING No. 3 STA
93-97	WING No. 4 PO
93-97	WING No. 4 STA
89-93	WING No. 5 PO
89-93	WING No. 5 STA
85-89	WING No. 6 PO
85-89	WING No. 6 STA
81-85	WING No. 7 PO
81-85	WING No. 7 STA
77-81	WING No. 8 PO
77-81	WING No. 8 STA
73-77	WING No. 9 PO
73-77	WING No. 9 STA
69-73	WING No. 10 PO
69-73	WING No. 10 STA
65-69	WING No. 11 PO
65-69	WING No. 11 STA
61-65	WING No. 12 PO
61-65	WING No. 12 STA
TOTAL	

SALT WATER B	
FRAME	TANK
109 FWD	FOREPEAK
23 AFT	AFTER PEAK
85-93	CENTER No. 4
23-30	S.W. BALLAS
23-47	S.W. BALLAS
32-58	DOUBLE BOTT
TOTAL	

FRESH WATER	
FRAMES	TANK
50-57	DISTILLED WA
50-57	POTABLE WAT
TOTAL	

MISCELLANEOUS	
FRAMES	TANK
23-32	BILGE WATER
54-55	SLUDGE
44-47	SEWAGE HOLD
TOTAL	

LUBE OIL	
FRAMES	TANK
41-44	LUBE OIL STORA
38-41	LUBE OIL SETTL
TOTAL	

FUEL OIL	
FRAMES	TANK
47-50	LOW SULFUR F
47-50	DIESEL OIL
50-61	FUEL OIL STO
50-61	FUEL OIL STO
58-59	FUEL OIL SETT
58-59	FUEL OIL SETT
TOTAL	

EQUIVALENTS:
1 TON = 2240 LBS
1 BARREL = 42 GALLONS
1 TON SALT WATER = 35 CUBIC FE
1 TON FRESH WATER = 36 CUBIC
1 TON FUEL OIL (15API) = 37.23 CUB
1 TON LUBE OIL = 40.00 CUBIC F
1 TON DIESEL OIL = 41 CUBIC FEE

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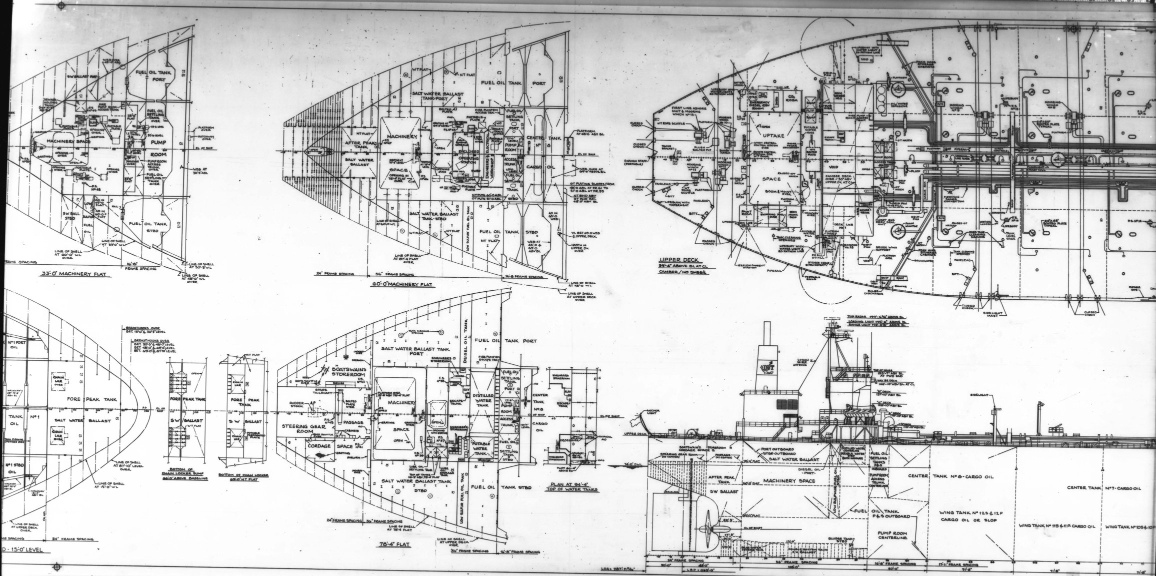
10X
FRAME 2


33'-0" MACHINERY FLAT
SW BALLAST
FUEL OIL TANK PORT
MACHINERY SPACE
PUMP ROOM
FUEL OIL SETTLING TANK
SW BALL STBD
FUEL OIL TANK STBD
FRAME SPACING
16'-8" FRAME SPACING
LINE OF SHELL AT 60'-0" WL OVER
LINE OF SHELL AT 33'-0" WL
LINE OF SHELL AT 48'-0" WL OVER
60'-0" MACHINERY FLAT
SALT WATER BALLAST TANK-PORT
AFTER PEAK TANK
SALT WATER BALLAST
MACHINERY SPACE
ENCLOSED OPERATING STATION
FUEL OIL TANK PORT
FUEL OIL SETTLING TANK
PUMP ROOM
CENTER TANK No 8
CARGO OIL
SALT WATER BALLAST TANK-STBD
FUEL OIL TANK STBD
24" FRAME SPACING
36" FRAME SPACING
16'-8" FRAME SPACING
UPPER DECK
39'-4" ABOVE BL AT CL
CAMBER / NO SHEER
UPTAKE SPACE
EMERGENCY DIESEL GEN ROOM
CO2 ROOM
PAINT ROOM
VOID
MOORING WINCH
FAIRLEAD
CLOSED CHOCK
BITT
ENSIGN STAFF (PORTABLE)
SIDELIGHT MAST
D - 15'-0" LEVEL
No 1 PORT OIL
FORE PEAK TANK
TANK No 1 OIL
SALT WATER BALLAST
CHAIN LKR
No 1 STBD OIL
24" FRAME SPACING
LINE OF SHELL AT UPPER DECK OVER
LINE OF SHELL AT 87'-10" LEVEL OVER
LINE OF SHELL AT 15'-0" WL
BOTTOM OF CHAIN LOCKER SUMP 66'-0" ABOVE BASELINE
BOTTOM OF CHAIN LOCKER 69'-0" NT FLAT
FORE PEAK TANK
SW BALLAST
78'-4" FLAT
SALT WATER BALLAST TANK PORT
BOATSWAINS STOREROOM
STEERING GEAR ROOM
CORDAGE SPACE
PASSAGE
MACHINERY SPACE
DISTILLED WATER TANK
POTABLE WATER TANK
SALT WATER BALLAST TANK STBD
DIESEL OIL TANK
FUEL OIL TANK PORT
FUEL OIL TANK STBD
LOW SULFUR FUEL OIL TANK
CENTER TANK No 8
CARGO OIL
24" FRAME SPACING
36" FRAME SPACING
16'-8" FRAME SPACING
PLAN AT 94'-4" TOP OF WATER TANKS
TOP RADAR
LOADING LIGHT
RANGE LIGHT
LORAN WIRE ANTENNA
SIDELIGHT
ANCHOR LIGHT
UPPER DECK
SALT WATER BALLAST
AFTER PEAK TANK
SW BALLAST
MACHINERY SPACE
DIESEL OIL
FUEL OIL SETTLING TANKS
PUMP ROOM ACCESS TRUNK
CENTER TANK No 8 - CARGO OIL
CENTER TANK No 7 - CARGO OIL
FUEL OIL TANK P & S OUTBOARD
PUMP ROOM CENTERLINE
WING TANK No 12S & 12P CARGO OIL OR SLOP
WING TANK No 11S & 11P CARGO OIL
WING TANK No 10S & 10P
SLUDGE TANK STBD
24" FRAME SPACING
36" FRAME SPACING
16'-8" FRAME SPACING
17'-11" FRAME SPACING
LOA = 1187'-11 3/16"
LBP = 1163'-0"

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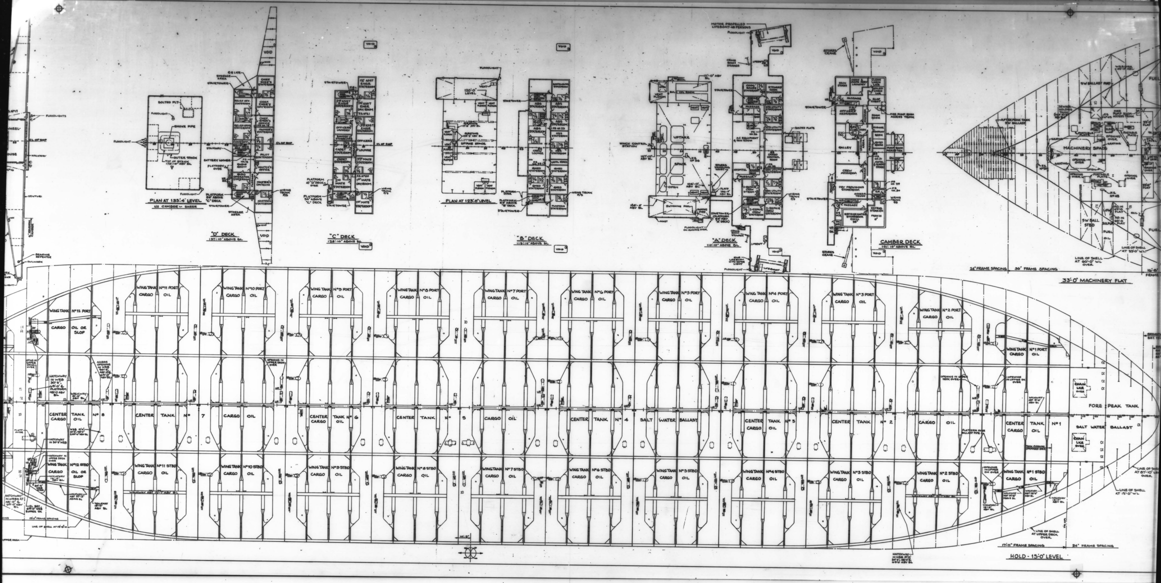
FRAME 3


PLAN AT 135'-4" LEVEL
NO CAMBER – SHEER
SMOKE PIPE
OUTER STACK
"D" DECK
137'-10" ABOVE BL
"C" DECK
128'-10" ABOVE BL
PLAN AT 123'-0" LEVEL
120'-0" LEVEL
UPTAKE SPACE
"B" DECK
119'-10" ABOVE BL
MOTOR PROPELLED LIFEBOAT-48 PERSONS
UPTAKE
SPACE
SWIMMING POOL
"A" DECK
110'-10" ABOVE BL
GALLEY
CREW MESSROOM
CAMBER DECK
101'-10" ABOVE BL
MACHINERY SPACE
24" FRAME SPACING
36" FRAME SPACING
33'-0" MACHINERY FLAT
VOID
WING TANK Nº 12 PORT CARGO OIL OR SLOP
WING TANK Nº 11 PORT CARGO OIL
WING TANK Nº 10 PORT CARGO OIL
WING TANK Nº 9 PORT CARGO OIL
WING TANK Nº 8 PORT CARGO OIL
WING TANK Nº 7 PORT CARGO OIL
WING TANK Nº 6 PORT CARGO OIL
WING TANK Nº 5 PORT CARGO OIL
WING TANK Nº 4 PORT CARGO OIL
WING TANK Nº 3 PORT CARGO OIL
WING TANK Nº 2 PORT CARGO OIL
WING TANK Nº 1 PORT CARGO OIL
CENTER TANK Nº 8 CARGO OIL
CENTER TANK Nº 7 CARGO OIL
CENTER TANK Nº 6 CARGO OIL
CENTER TANK Nº 5 CARGO OIL
CENTER TANK Nº 4 SALT WATER BALLAST
CENTER TANK Nº 3 CARGO OIL
CENTER TANK Nº 2 CARGO OIL
CENTER TANK Nº 1 SALT WATER BALLAST
FORE PEAK TANK
CHAIN LKR
WING TANK Nº 12 STBD CARGO OIL OR SLOP
WING TANK Nº 11 STBD CARGO OIL
WING TANK Nº 10 STBD CARGO OIL
WING TANK Nº 9 STBD CARGO OIL
WING TANK Nº 8 STBD CARGO OIL
WING TANK Nº 7 STBD CARGO OIL
WING TANK Nº 6 STBD CARGO OIL
WING TANK Nº 5 STBD CARGO OIL
WING TANK Nº 4 STBD CARGO OIL
WING TANK Nº 3 STBD CARGO OIL
WING TANK Nº 2 STBD CARGO OIL
WING TANK Nº 1 STBD CARGO OIL
LINE OF SHELL AT 15'-0" WL
17'-11" FRAME SPACING
24" FRAME SPACING
HOLD - 15'-0" LEVEL

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MICRO-MASTER® 105 mm

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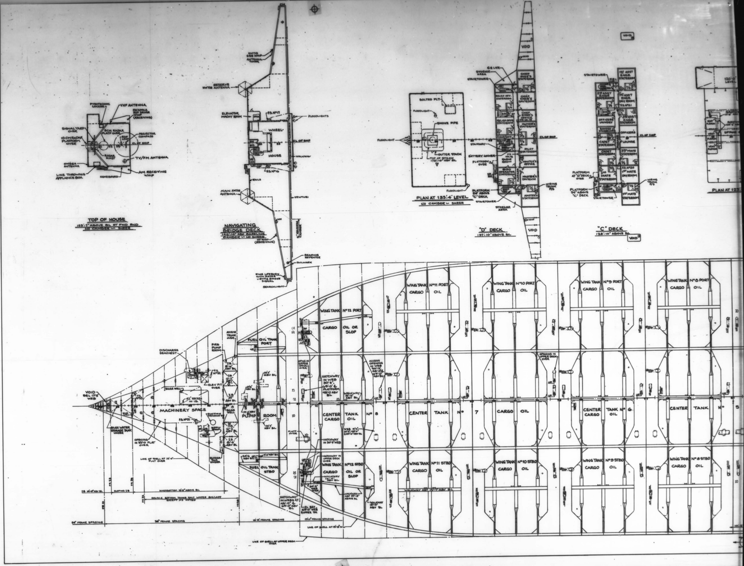
FRAME 4


TOP OF HOUSE
155'-7" ABOVE BL AT FWD END
NO CAMBER ~ SHEER
PYROTECHNIC LOCKER
VHF ANTENNA
FACSIMILE RDF SENSE WHIP (RECEIVING)
SIGNAL YARD OVER
10 CM RADAR PLATFORM OVER
S CM RADAR PLATF OVER
RDF LOOP
PROJECTOR COMPASS
CL OF SHIP
RADAR MAST
TV/FM ANTENNA
OMEGA ANTENNA
LINE THROWING APPLIANCE BOX
NAMEBOARD
AM RECEIVING WHIP
NAVIGATING BRIDGE DECK
146'-10" ABV BASELINE
CAMBER ~ NO SHEER
RESERVE XMTG ANTENNA
ELEVATOR MACHY ROOM
F.S. Nº17
FLOODLIGHTS
WHEEL
HOUSE
WALKWAY
F.S. Nº16
RAILS
MAIN XMTG ANTENNA
VENTURI
HF WHIP (RECEIVING)
BEARING REPEATER
BULWARK
RING LIFEBUOY WITH WATER LIGHT & SMOKE SIGNAL
SEARCHLIGHT
PLAN AT 135'-4" LEVEL
NO CAMBER ~ SHEER
BOLTED PLT
FLOODLIGHT
SMOKE PIPE
OUTER STACK
TOP OF STACK 175'-10" ABV BL
"D" DECK
137'-10" ABOVE BL
VOID
CG LKR
STORAGE AREA
STAIRTOWER
CHIEF ENGR'S STATEROOM
RELIEF OFF. STATEROOM
CHIEF ENGR'S DAYROOM
CHIEF ENGR'S OFFICE
OWNER'S STATEROOM
CONT OFF.
EQUIP RM
STAIRWAY
PILOT STATEROOM
BATTERY LOCKER
RADIO ROOM
MASTER'S OFFICE
PLATFORM OVER
RADIO OPERATOR STATEROOM
PASSAGE
MASTER'S DAYROOM
WIRING TRUNK P/S
PLATFORM 5'-6" ABOVE "C" DECK
MASTER'S STATEROOM
"C" DECK
128'-10" ABOVE BL
1ST ASST ENGR STATEROOM
2ND ASST ENGR STATEROOM
1ST ASST ENGR DAYROOM
F.S. Nº21
OFFICERS' LAUNDRY
3RD ASST ENGR STATEROOM
OFFICERS' LOUNGE
CADET STATEROOM
3RD MATE STATEROOM
F.S. Nº20
1ST MATE DAYROOM
2ND MATE STATEROOM
PLATFORM AT "D" DECK OVER
1ST MATE STATEROOM
120'-0" LEVEL
VENT PLENUM
UPTAKE
PLAN AT 125'
WING TANK Nº11 PORT CARGO OIL
WING TANK Nº10 PORT CARGO OIL
WING TANK Nº9 PORT CARGO OIL
WING TANK Nº8 PORT CARGO OIL
WING TANK Nº12 PORT CARGO OIL OR SLOP
FUEL OIL TANK PORT
ACCESS TRUNK OVER
FIRE PUMP ROOM
DISCHARGE SEACHEST
ELEV PIT OVER
BILGE WELL
42" RECESS IN I.B.
VOID BEL 17'-5" WEB
MACHINERY SPACE
SUCTION SEACHEST
F.S. Nº31
F.S. Nº32
BILGE WATER STORAGE TANK UNDER
OPENING IN 33'-0" FLAT OVER
SLUDGE TANK UNDER
PUMP ROOM
HATCHWAY IN WEB 30'-5", 49'-0" & PLATFORM 48'-0" ABV BL
WALKWAY 15'-0" ABV BL
ACCESS OPENING IN WEB 30'-5", 48'-0" & 69'-0" ABV BL
CENTER TANK Nº 8 CARGO OIL
CENTER TANK Nº 7 CARGO OIL
CENTER TANK Nº 6 CARGO OIL
CENTER TANK Nº
HATCHWAY IN 30'-5" WEB
FLATF OVER
HATCHWAY IN UPPER DECK OVER
FUEL OIL TANK STBD
WING TANK Nº12 STBD CARGO OIL OR SLOP
WING TANK Nº11 STBD CARGO OIL
WING TANK Nº10 STBD CARGO OIL
WING TANK Nº9 STBD CARGO OIL
WING TANK Nº8 STBD CARGO OIL
WALKWAY 10'-0" ABV BL
WALKWAY ABT 27'-2" ABOVE BL
HATCHWAY IN WEBS AT 48'-0" & 69'-0" ABV BL
LINE OF SHELL AT 35'-0" FLAT OVER
IB 14'-0" ABV BL
SLOPING IB
INNERBOTTOM 10'-0" ABOVE BL
DOUBLE BOTTOM TANKS SALT WATER BALLAST EXCEPT AS NOTED
FR 21
FR 23
FR 33
24" FRAME SPACING
36" FRAME SPACING
15'-0" FRAME SPACING
17'-11" FRAME SPACING
LINE OF SHELL AT 15'-0" W.L.
LINE OF SHELL AT UPPER DECK OVER

MICRO-MASTER® 105 mm
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TRIM AND STABILITY BOOKLET

390,000 DWT. BULK OIL CARRIER

U.S.T. PACIFIC

OFFICIAL NO. 613131

OWNER
UNITED STATES TRUST
COMPANY of NEW YORK

BUILDER
NEWPORT NEWS SHIPBUILDING, NEWPORT NEWS, VA.

BUILDER'S HULL NO. 614C
MARAD HULL NO. 310

N.N.S. PLAN NO. 0100-1303
REV. A

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REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D	OWNER DATE	OWNER APPD.
A		INITIAL ISSUE	9/12/79 ROW			

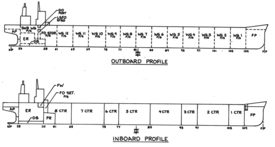
REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D	OWNER DATE	OWNER APPD.

NEWPORT NEWS SHIPBUILDING

DATE SEPTEMBER 12, 1979
AUTHORIZED R. L. Harington
NAVAL ARCHITECT

N.N.S. PLAN NO. 0100-1303
BUILDER'S HULL NO. 614C



OUTBOARD PROFILE

INBOARD PROFILE

GENERAL DATA

LENGTH OVERALL	1187 FT - 11 11/16 IN
LENGTH BETWEEN PERPENDICULARS	1143 FT - 0 IN
BEAM, MLD	228 FT - 0 IN
DEPTH, MLD TO UPPER DECK AT SIDE	95 FT - 0 IN
DEPTH, MLD TO UPPER DECK AT C.L.	99 FT - 4 IN
DESIGN DRAFT, MLD	74 FT - 0 IN
DESIGN DRAFT, KEEL	74 FT - 1 1/16 IN
DESIGN DISPLACEMENT, TOTAL, S.W.	450684 LT
DEADWEIGHT CORRESPONDING TO DESIGN DISPL, S.W.	391844 LT
INTERNATIONAL SUMMER DRAFT, KEEL, S.W.	75 FT - 0 5/16 IN
INTERNATIONAL TANKER SUMMER FREEBOARD	20 FT - 1 3/4 IN
DISPLACEMENT AT SUMMER DRAFT, S.W.	456983 LT
DEADWEIGHT AT SUMMER DRAFT, S. W.	398143 LT
LIGHT SHIP WEIGHT	58840 LT
LIGHT SHIP VERTICAL CENTER OF GRAVITY ABV B.L.	66.50 FT
LIGHT SHIP LONGL CENTER OF GRAVITY AFT F.P.	604.53 FT
CARGO CAPACITY, 98% FULL	3000147 BBLS
GROSS REGISTER TONNAGE	189416.92
NET REGISTER TONNAGE	171126.00

PROPELLER IS IMMERSED AT 38 FT-3 IN KEEL DRAFT

RADIO CALL LETTERS WHNL

PROPELLING MACHINERY

BOILERS	2 - WATERTUBE C.E. 850# G. 950°F
TURBINES	GENERAL ELECTRIC, 45000 ABS RATED SHP, 85 RPM
REDUCTION GEARS	GENERAL ELECTRIC
PROPELLER	1 - 6 BLADED NICKEL-ALUMINUM-BRONZE, 31 FT-6IN DIA, 19.341 FT PITCH AT .7 RADIUS
DESIGN SERVICE SPEED (CLEAN HULL)	15.9 KNOTS AT ABS POWER AND DESIGN DRAFT

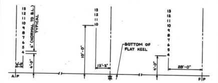
PUMPS

MAIN CARGO PUMPS CAPACITY (EACH)	4-TURBINE DRIVEN, HORIZONTAL-CENTRIFUGAL, 22500 GPM, RATED TOTAL HEAD 200 PSIG, EQUIPPED WITH WORTHINGTON VAC-STRIP SYSTEM
BILGE AND STRIPPING PUMP CAPACITY	1-VERTICAL DUPLEX DOUBLE ACTING RECIPRICATING - 1200 GPM, 200 PSIG DISCHARGE PRESSURE
BALLAST PUMP CAPACITY	1-TURBINE DRIVEN, HORIZONTAL CENTRIFUGAL - 22500 GPM, RATED TOTAL HEAD 100 FEET, EQUIPPED WITH WORTHINGTON VAC-STRIP SYSTEM
BILGE AND BALLAST PUMPS CAPACITY (EACH)	2-HORIZONTAL CENTRIFUGAL 885 GPM, RATED TOTAL HEAD 115 FEET

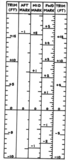
INTERNATIONAL FREEBOARD, DRAFT & DEADWEIGHT DATA

SUMMER		
MOLDED DEPTH AMIDSHIPS TO UPPER DECK AT SIDE	95'-0"	
THICKNESS OF UPPER DECK STRINGER PLATE AMIDSHIPS	0'-1"	
TOTAL	95'-1"	
SUMMER FREEBOARD ASSIGNED BY A.B.S.	20'-1¾"	
MOLDED DRAFT TO SUMMER FREEBOARD LINE	74'-11¼"	
BOTTOM OF KEEL BELOW MOLDED BASE LINE	0'-1 1/16"	
SUMMER DRAFT, KEEL	75'-0 5/16"	
CORRESPONDING DISPLACEMENT, SEA WATER	456983	L.T.
CORRESPONDING DEADWEIGHT	398143	L.T.
FRESH WATER		
FRESH WATER FREEBOARD ASSIGNED BY A.B.S.	18'-5⅜"	
MOLDED DRAFT TO FRESH WATER FREEBOARD LINE	76'-7⅝"	
BOTTOM OF KEEL BELOW MOLDED BASE LINE	0'-1 1/16"	
FRESH WATER DRAFT, KEEL	76'-8 11/16"	
CORRESPONDING DISPLACEMENT, FRESH WATER	455362	L.T.
CORRESPONDING DEADWEIGHT	396522	L.T.
TROPICAL		
TROPICAL FREEBOARD ASSIGNED BY A.B.S.	18'-7"	
MOLDED DRAFT TO TROPICAL FREEBOARD LINE	76'-6"	
BOTTOM OF KEEL BELOW MOLDED BASE LINE	0'-1 1/16"	
TROPICAL DRAFT, KEEL	76'-7 1/16"	
CORRESPONDING DISPLACEMENT, SEA WATER	467464	L.T.
CORRESPONDING DEADWEIGHT	408624	L.T.
TROPICAL FRESH WATER		
TROPICAL F.W. FREEBOARD ASSIGNED BY A.B.S.	16'-10⅝"	
MOLDED DRAFT TO TROPICAL F.W. FREEBOARD LINE	78'-2⅜"	
BOTTOM OF KEEL BELOW MOLDED BASE LINE	0'-1 1/16"	
TROPICAL FRESH WATER DRAFT, KEEL	78'-3 7/16"	
CORRESPONDING DISPLACEMENT, TROPICAL F.W.	465579	L.T.
CORRESPONDING DEADWEIGHT	406739	L.T.
WINTER		
WINTER FREEBOARD ASSIGNED BY A.B.S.	21'-8½"	
MOLDED DRAFT TO WINTER FREEBOARD LINE	73'-4½"	
BOTTOM OF KEEL BELOW MOLDED BASE LINE	0'-1 1/16"	
WINTER DRAFT, KEEL	73'-5 9/16"	
CORRESPONDING DISPLACEMENT, SEA WATER	446529	L.T.
CORRESPONDING DEADWEIGHT	387689	L.T.
WINTER, NORTH ATLANTIC		
W.N.A. FREEBOARD ASSIGNED BY A.B.S.	N/A	
MOLDED DRAFT TO W.N.A. FREEBOARD LINE	N/A	
BOTTOM OF KEEL BELOW MOLDED BASE LINE	N/A	
WINTER NORTH ATLANTIC DRAFT, KEEL	N/A	
CORRESPONDING DISPLACEMENT, SEA WATER	N/A	L.T.
CORRESPONDING DEADWEIGHT	N/A	L.T.

DRAFT MARK LOCATIONS



CORRECTION (IN INCHES) TO DRAFTS AT FP, Ⅸ, & AP



INSTRUCTIONS FOR COMPUTING DRAFTS AT DRAFT MARKS

1. PLACE A STRAIGHT EDGE (SUCH AS A TRIANGLE) HORIZONTALLY ACROSS GRAPH AT RIGHT SUCH THAT THE VESSEL'S TRIM BETWEEN PERPENDICULARS (+ AFT, - FWD) IS READ ON BOTH TRIM SCALES.
2. WHERE THE STRAIGHT EDGE INTERSECTS THE AFT, MID, AND FWD DRAFT MARK SCALES, READ THE CORRECTIONS TO BE ADDED TO THE DRAFTS AT AP, Ⅸ, AND FP, RESPECTIVELY.

EXAMPLE

GIVEN CALCULATED DRAFTS AT AP, Ⅸ, AND FP, WITH TRIM BETWEEN PERPENDICULARS EQUAL TO 8.0 FEET BY THE STERN, FIND DRAFTS AT FWD, MIDSHIP, AND AFT DRAFT MARKS.

	AFT	MIDSHIP	FWD
DRAFT AT PERPENDICULAR	44'-0"	40'-0"	36'-0"
+ CORRECTION (FROM GRAPH)	- 0'-0½"	+ 0'-1"	+ 0'-2⅜"
DRAFT AT DRAFT MARK	43'-11½"	40'-1"	36'-2⅜"

GENERAL NOTES

1. THE ACCOMPANYING DATA HAS BEEN PREPARED TO PERMIT A QUICK AND RELIABLE ESTIMATE OF THE TRIM, STABILITY, DRAFTS, ETC., OF THE SHIP UNDER VARIOUS LOADING CONDITIONS.
2. THE DATA CONTAINED HEREIN, IN CONJUNCTION WITH OTHER DATA FURNISHED THE VESSEL, WILL PROVIDE THE MASTER WITH SUFFICIENT INFORMATION TO DETERMINE THE AVAILABLE GM AND FREEBOARD FOR ANY CONDITION OF LOADING OR OPERATION OF THE VESSEL.
3. THE CALCULATIONS FOR DETERMINING THE ESTIMATED DRAFTS ARE BASED ON THE RESULTS OF A LIGHT SHIP WEIGHT CHECK FOR A SIMILAR VESSEL CONDUCTED ON NOVEMBER 1, 1978, UNDER THE SUPERVISION OF THE UNITED STATES COAST GUARD. SEE NOTE NO. 8
4. THE VESSEL HAS BEEN REVIEWED FOR DAMAGE STABILITY ASSUMING THE FOLLOWING EXTENT OF DAMAGE:

A) LONGITUDINAL EXTENT

ONE COMPARTMENT DAMAGE OCCURRING ANYWHERE ALONG THE VESSEL'S LENGTH, OR TWO COMPARTMENT DAMAGE OCCURRING ANYWHERE WITHIN THE CARGO LENGTH.

B) TRANSVERSE EXTENT

DAMAGE EXTENDING INBOARD A DISTANCE OF 45.6 FEET MEASURED FROM THE SIDE OF THE SHIP PERPENDICULARLY TO THE CENTERLINE AT THE LEVEL OF THE SUMMER LOAD WATERLINE.

C) VERTICAL EXTENT
DAMAGE EXTENDING FROM THE BASELINE UPWARDS WITHOUT LIMIT.

WITH THESE ASSUMPTIONS, THE VESSEL HAS BEEN FOUND TO REMAIN AFLOAT IN A SATISFACTORY CONDITION OF EQUILIBRIUM.

5. "SLACK" TANKS ARE DEFINED AS FOLLOWS:

A) CARGO TANKS WHICH ARE NOT EMPTY BUT WHICH ARE FILLED TO LESS THAN 98% OF THE TANK VOLUME.

B) SALT WATER BALLAST TANKS WHICH ARE NEITHER EMPTY NOR PRESSED-UP.

C) CONSUMABLE LIQUID TANKS WHICH ARE NEITHER EMPTY NOR PRESSED-UP.

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GENERAL NOTES (CONT'D)

6. DRAFTS HEREIN REFEARED TO AS MEAN, FWD, AND AFT ARE DRAFTS AT MIDSHIP, FOREWARD PERPENDICULAR, AND AFTER PERPENDICULAR, RESPECTIVELY. GENERALLY, IT IS SUFFICIENTLY ACCURATE TO ASSUME THAT THESE LOCATIONS COINCIDE WITH THE DRAFT MARKS. HOWEVER, IF GREATER ACCURACY IS DESIRED, DRAFTS AT THE DRAFT MARKS MAY BE COMPUTED USING THE CORRECTIONS GIVEN ON PAGE 8.

7. ALL TONS HEREIN ARE LONG TONS OF 2240 LBS.

8. CALCULATIONS FOR THIS VESSEL BASED ON KNOWN DIFFERENCES FROM THE PARENT VESSEL INDICATE A LIGHT SHIP WEIGHT OF 58,842 LONG TONS (AN INCREASE OF 2 LONG TONS OVER THE PARENT VESSEL). THIS SMALL DIFFERENCE WILL HAVE A NEGLEGIBLE EFFECT ON THE ACCURACY OF THE CALCULATIONS CONTAINED HEREIN.

OPERATING INSTRUCTIONS

1. NO CARGO TANK SHALL BE LOADED TO MORE THAN 98% OF THE TANK VOLUME (SEE PAGE 16).
2. AT DRAFTS GREATER THAN 65 FEET, THE VESSEL SHALL NOT BE OPERATED WITH A TRIM BETWEEN PERPENDICULARS EXCEEDING 10 FEET, EITHER BY THE BOW OR BY THE STERN. AT DRAFTS OF 65 FEET OR LESS, TRIMS NOT EXCEEDING 10 FEET BY THE BOW OR 20 FEET BY THE STERN MAY BE PERMITTED.
3. ALL UPPER DECK HATCHES, MANHOLES, SCUTTLES, AND WEATHER DOORS SHALL BE KEPT CLOSED AND FULLY SECURED AT ALL TIMES WHEN UNDERWAY, EXCEPT WHEN ACTUALLY USED FOR TRANSIT UNDER SAFE CONDITIONS.
4. ALL BOLTED WATERTIGHT MANHOLE COVERS THROUGHOUT THE SHIP SHALL BE KEPT CLOSED AND FULLY SECURED EXCEPT WHEN ACTUALLY IN USE UNDER SAFE CONDITIONS.
5. ALL VALVES IN THE CARGO AND BALLAST SYSTEMS SHALL BE KEPT CLOSED AT ALL TIMES EXCEPT WHEN ACTUALLY IN USE DURING LOADING OR BALLASTING OPERATIONS.
6. CROSS CONNECTIONS BETWEEN PORT AND STARBOARD FUEL OIL STORAGE AND SETTLING TANKS SHALL BE KEPT CLOSED AT ALL TIMES EXCEPT WHEN ACTUALLY IN USE FOR TRANSFER OF FUEL OIL.
7. BILGES NOT BEING UTILIZED AS TANKAGE SHALL BE KEPT PUMPED TO MINIMUM CONTENT AT ALL TIMES.
8. SYMMETRICAL TANK PAIRS SHALL BE KEPT FILLED TO APPROXIMATELY THE SAME LEVEL PORT AND STARBOARD TO ELIMINATE LIST.
9. THE NUMBER OF SLACK CARGO AND BALLAST TANKS SHALL BE KEPT TO A MINIMUM CONSISTENT WITH OPERATIONAL REQUIREMENTS.
10. DURING BALLASTING OR DEBALLASTING, AND DURING LOADING OR UNLOADING OF CARGO, A REDUCTION IN THE VESSEL'S GM WILL OCCUR DUE TO SLACK TANK FREE SURFACE UNTIL THE TANK IS PRESSED UP OR EMPTY. THIS TEMPORARY LOSS OF GM (IN FEET) IS EQUAL TO THE SLACK FREE SURFACE MOMENT OF THE TANK DIVIDED BY THE VESSEL'S DISPLACEMENT (IN LONG TONS). SEE PAGE 18 FOR FREE SURFACE MOMENTS.
11. CARE SHOULD BE TAKEN TO ASSURE THAT THE VESSEL WILL HAVE AT LEAST TWO INCHES OF POSITIVE GM DURING LOADING OR UNLOADING OPERATIONS WHILE IN PORT. SEE INSTRUCTION NO. 10.
12. IN SEA-GOING CONDITIONS, THE VESSEL'S GM SHALL BE EQUAL TO OR GREATER THAN THE GM REQUIRED AS READ FROM THE CURVE OF GM REQUIRED ON PAGE 20.

OPERATING INSTRUCTIONS (CONT'D)

13. IN THE EVENT OF DAMAGE TO THE VESSEL WHICH MAY RESULT IN FLOODING, THE FOLLOWING ACTIONS SHOULD BE TAKEN IMMEDIATELY:
    - A) VERIFY THAT ALL OPENINGS SPECIFIED IN INSTRUCTION NO. 3 ARE CLOSED AND FULLY SECURED, AND IN ADDITION, CLOSE AND SECURE ALL VENTS AND ANY OTHER OPENINGS ON UPPER DECK WHICH ARE PROVIDED WITH COVERS, DOORS, OR OTHER MEANS OF BEING MADE WATERTIGHT OR WEATHERTIGHT.
    - B) VERIFY THAT ALL VALVES SPECIFIED IN INSTRUCTIONS 5 AND 6 ARE FULLY CLOSED

PROCEDURE FOR CALCULATION

LOADING TABLE AND TRIM & STABILITY CALCULATIONS, PAGE 28:

1. FOR EACH LOADED SPACE ON THE VESSEL, ENTER WEIGHT (IN LONG TONS) IN COLUMN (B). SEE PAGES 16 AND 17.
2. THE LOADED VESSEL'S DISPLACEMENT IS OBTAINED BY ADDING THE ENTRIES IN COLUMN (B) ON LINES 1 THRU 34. ENTER THE SUM ON LINES 35 AND 36.
3. FOR EACH LOADED SPACE, THE APPROPRIATE VALUE FOR THE DISTANCE OF ITS LONGITUDINAL CENTER OF GRAVITY (LCG) FROM THE FOREWARD PERPENDICULAR IS GIVEN IN COLUMN (C). MULTIPLY EACH ENTRY IN COLUMN (B) BY THE NUMBER IN COLUMN (C) AND ENTER THE PRODUCT IN COLUMN (D).
4. ADD ENTRIES IN COLUMN (D) AND ENTER THE SUM ON LINE 35.
5. THE LOADED VESSEL'S LCG IS OBTAINED BY DIVIDING THE SUM OF COLUMN (D) ON LINE 35 BY THE DISPLACEMENT, LINE 35, COLUMN (B). ENTER THE RESULT UNDER COLUMN (C) ON LINE 35 AND ON LINE 38.
6. FOR EACH LOADED SPACE, THE APPROPRIATE VALUE FOR THE HEIGHT OF ITS VERTICAL CENTER OF GRAVITY (VCG) ABOVE THE BASELINE IS GIVEN IN COLUMN (E). MULTIPLY EACH ENTRY IN COLUMN (B) BY THE NUMBER IN COLUMN (E) AND ENTER THE PRODUCT IN COLUMN (F).
7. ADD ENTRIES IN COLUMN (F) AND ENTER THE SUM ON LINE 35.
8. THE LOADED VESSEL'S VCG IS OBTAINED BY DIVIDING THE SUM OF COLUMN (F) ON LINE 35 BY THE DISPLACEMENT, LINE 35, COLUMN (B). ENTER THE RESULT UNDER COLUMN (E) ON LINE 35 AND ON LINE 51.
9. FOR EACH TANK WHICH IS NOT EMPTY OR PRESSED UP, ENTER COLUMN (G) WITH THE APPROPRIATE FREE SURFACE FROM THE TABLE ON PAGE 18. "SLACK" FREE SURFACE HAS BEEN ENTERED FOR THE SETTLERS AND FOR CONSUMABLE LIQUID STOWAGE TANKS. THIS REQUIREMENT WILL ALLOW THE USE OF THE VESSEL'S TANKAGE WITHOUT UNDETECTED LOW STABILITY DUE TO FREE SURFACE OCCURRING AT ANY TIME DURING THE VOYAGE.
10. ADD ENTRIES IN COLUMN (G) AND ENTER THE SUM ON LINE 35.
11. THE FREE SURFACE CORRECTION TO GM IS OBTAINED BY DIVIDING THE SUM OF COLUMN (G) ON LINE 35 BY THE DISPLACEMENT, LINE 35, COLUMN (B). ENTER THE RESULT ON LINE 53.

PROCEDURE FOR CALCULATION (CONT'D)

12. REFER TO THE GRAPH OF HYDROSTATIC DATA ON PAGE 22 OR 23. PLACE A STRAIGHT EDGE (SUCH AS A TRIANGLE) ACROSS THE GRAPH AT THE DISPLACEMENT OBTAINED IN STEP 2 AND SUCH THAT THE SAME DRAFT IS READ IN BOTH DRAFT COLUMNS. READ DRAFT, TRANSVERSE METACENTER, LCF, LCB, MOMENT TO TRIM 1", AND TONS PER INCH IMMERSION, AND ENTER THESE VALUES ON LINES 44, 50, 43, 39, 41 AND 37, RESPECTIVELY.
13. COMPLETE THE DRAFT AND TRIM CALCULATIONS BY PERFORMING THE OPERATIONS INDICATED ON LINES 40, 42, 45, 46, 47, 48 AND 49. BE SURE TO RECORD THE PROPER SIGN (+ OR -) ON LINES 40, 42 AND 45.
14. COMPLETE THE STABILITY CALCULATIONS BY PERFORMING THE OPERATIONS INDICATED ON LINES 52, 54, 55 AND 56.

CONVERSION/DENSITY TABLES

A.P.I. CONVERSION DATA (60°F) - CARGO OIL

API GRAV.	SPEC. GRAV.	LBS. U.S.GAL.	GALS/TON U.S.	BBLS/TON U.S.	CU. FT./TON
18	0.9465	7.891	283.88	6.758	37.947
26	0.8984	7.490	299.08	7.119	39.979
34	0.8550	7.128	314.28	7.481	42.011
44	0.8063	6.722	333.28	7.934	44.551

LIQUID DENSITIES - MISC. DEADWEIGHT

FUEL OIL (15°API): 1 TON=37.23 CU. FT.=278.46 GALLONS=6.63 BBLS.
DIESEL OIL: 1 TON=41.00 CU. FT.=306.68 GALLONS=7.302 BBLS.
LUBE OIL: 1 TON=40.00 CU. FT.=299.20 GALLONS=7.124 BBLS.
SALT WATER: 1 TON=35.00 CU. FT.=261.82 GALLONS=6.234 BBLS.
FRESH WATER: 1 TON=36.00 CU. FT.=269.30 GALLONS=6.412 BBLS.

CONVERSION OF UNITS OF VOLUME

1 CUBIC FOOT = 0.028317 CUBIC METER = 7.48052 GALLONS
1 BARREL = 5.615 CUBIC FEET = 42 GALLONS

CONVERSION OF UNITS OF LENGTH

1 INCH = 2.54 CENTIMETERS
1 FOOT = 0.3048 METERS

NOTE:

1. ALL TONS HEREIN ARE LONG TONS OF 2240 LBS.
2. ALL GALLONS HEREIN ARE U.S. GALLONS EQUIVALENT TO 0.83268 IMPERIAL GALLONS.

CAPACITIES & CENTERS OF GRAVITY

CARGO OIL		CAPACITY - BBLS		CENTERS OF GRAVITY	
FRAMES	TANK	100% FULL	98% FULL	ABOVE BL	AFT OF FP
105-109	CENTER No. 1	97422	95474	49.32	115.85
97-105	CENTER No. 2	194638	190745	49.30	223.34
93-97	CENTER No. 3	97163	95220	49.30	330.83
77-85	CENTER No. 5	193615	189743	49.30	581.67
73-77	CENTER No. 6	96967	95028	49.30	689.17
65-73	CENTER No. 7	193985	190105	49.30	796.67
59-65	CENTER No. 8	119583	117191	53.95	914.00
105-109	WING No. 1 PORT	56358	55231	53.81	119.55
105-109	WING No. 1 STARBOARD	56358	55231	53.81	119.55
101-105	WING No. 2 PORT	81314	79687	50.70	188.63
101-105	WING No. 2 STARBOARD	81314	79687	50.70	188.63
97-101	WING No. 3 PORT	89757	87962	49.00	259.37
97-101	WING No. 3 STARBOARD	89757	87962	49.00	259.37
93-97	WING No. 4 PORT	91193	89369	48.40	330.86
93-97	WING No. 4 STARBOARD	91193	89369	48.40	330.86
89-93	WING No. 5 PORT	91279	89453	48.35	402.50
89-93	WING No. 5 STARBOARD	91279	89453	48.35	402.50
85-89	WING No. 6 PORT	91279	89453	48.35	474.17
85-89	WING No. 6 STARBOARD	91279	89453	48.35	474.17
81-85	WING No. 7 PORT	91267	89442	48.35	545.83
81-85	WING No. 7 STARBOARD	91267	89442	48.35	545.83
77-81	WING No. 8 PORT	91279	89453	48.35	617.50
77-81	WING No. 8 STARBOARD	91279	89453	48.35	617.50
73-77	WING No. 9 PORT	91279	89453	48.35	689.17
73-77	WING No. 9 STARBOARD	91279	89453	48.35	689.17
69-73	WING No. 10 PORT	91153	89330	48.42	760.80
69-73	WING No. 10 STARBOARD	91153	89330	48.42	760.80
65-69	WING No. 11 PORT	88994	87214	49.32	832.18
65-69	WING No. 11 STARBOARD	88994	87214	49.32	832.18
61-65	WING No. 12 PORT	78864	77286	52.62	902.87
61-65	WING No. 12 STARBOARD	78840	77263	52.62	902.87
TOTAL		3,061,381	3,000,147		

SALT WATER BALLAST		CAPACITY		CENTERS OF GRAVITY	
FRAME	TANK		100% FULL S.W. TONS	ABOVE BL	AFT OF FP
109 FWD	FOREPEAK		17,158.99	50.23	49.79
23 AFT	AFTER PEAK		3,274.13	67.28	1,122.09
85-93	CENTER No. 4		31,156.40	49.30	438.33
23-50	S.W. BALLAST PORT		3,639.99	75.43	1,048.60
23-47	S.W. BALLAST STARBOARD		3,211.82	77.51	1,052.62
32-58	DOUBLE BOTTOM		892.06	6.41	1,026.43
TOTAL			59,333.4		

CAPACITIES & CENTERS OF GRAVITY

FRESH WATER		CAPACITY		CENTERS OF GRAVITY	
FRAMES	TANK		100% FULL F.W. TONS	ABOVE BL	AFT OF FP
50-57	DISTILLED WATER		460.64	86.29	1,003.75
50-57	POTABLE WATER		162.11	86.29	1,003.75
TOTAL			622.75		

MISCELLANEOUS		CAPACITY - CUBIC FEET		CENTERS OF GRAVITY	
FRAMES	TANK	100% FULL	98% FULL	ABOVE BL	AFT OF FP
23-32	BILGE WATER STORAGE	4633	4540	7.03	1080.32
54-55	SLUDGE	182	179	8.97	1003.41
44-47	SEWAGE HOLDING	1837	1800	46.07	1027.60
TOTAL		6652	6519		

LUBE OIL		CAPACITY - GALLONS		CENTERS OF GRAVITY	
FRAMES	TANK	100% FULL	98% FULL	ABOVE BL	AFT OF FP
41-44	LUBE OIL STORAGE	11,020	10,800	85.41	1036.50
38-41	LUBE OIL SETTLING	10,938	10,719	85.41	1045.50
TOTAL		21,958	21,519		

FUEL OIL		CAPACITY - BARRELS		CENTERS OF GRAVITY	
FRAMES	TANK	100% FULL	98% FULL	ABOVE BL	AFT OF FP
47-50	LOW SULFUR FUEL OIL	4340	4253	70.52	1018.44
47-50	DIESEL OIL	1672	1639	87.70	1018.47
50-61	FUEL OIL STORAGE PORT	54490	53400	61.20	972.81
50-61	FUEL OIL STORAGE STARBOARD	54490	53400	61.20	972.81
58-59	FUEL OIL SETTLING PORT	3340	3273	73.66	981.64
58-59	FUEL OIL SETTLING STARBOARD	3340	3273	73.66	981.64
TOTAL		121672	119238		

TABLE FOR FREE SURFACE CORRECTIONS

CARGO OIL TANKS							
TANK	FRAMES	CARGO @ 38.0 FT^3/LT		CARGO @ 44.38 FT^3/LT		S.W. BALLAST	
		98% FULL	SLACK	98% FULL	SLACK	98% FULL	SLACK
CTR. NO. 1	105-109	57187	75562	49076	64846	62089	82039
CTR. NO. 2	97-105	114375	151125	98154	64846	124178	164078
CTR. NO. 3	93-97	57187	75562	49076	64846	62089	82039
CTR. NO. 5	77-85	114375	151125	98154	64846	124178	164078
CTR. NO. 6	73-77	57187	75562	49076	64846	62089	82039
CTR. NO. 7	65-73	114375	151125	98154	95002	124178	164078
CTR. NO. 8	59-65	83782	110702	71900	55243	90963	120191
WG. NO. 1 P/S	105-109	49809	64372	42744	105050	54078	69890
WG. NO. 2 P/S	101-105	94717	122411	81284	114772	102835	132903
WG. NO. 3 P/S	97-101	103483	133741	88806	114772	112353	145204
WG. NO. 4 P/S	93-97	103483	133741	88806	114772	112353	145204
WG. NO. 5 P/S	89-93	103483	133741	88806	114772	112353	145204
WG. NO. 6 P/S	85-89	103483	133741	88806	114772	112353	145204
WG. NO. 7 P/S	81-85	103483	133741	88806	114772	112353	145204
WG. NO. 8 P/S	77-81	103483	133741	88806	114772	112353	145204
WG. NO. 9 P/S	73-77	103483	133741	88806	114772	112353	145204
WG. NO. 10 P/S	69-73	103483	133741	88806	114772	112353	145204
WG. NO. 11 P/S	65-69	103483	133741	88806	114772	112353	145204
WG. NO. 12 P/S	61-65	100963	130484	86640	111978	109617	141668

NOTE: USE THE VALUE IN THE 98% FULL COLUMN UNLESS THE LIQUID SURFACE IS BELOW THE 98% LEVEL, IN WHICH CASE USE THE VALUE IN THE SLACK COLUMN.

SALT WATER BALLAST		
TANK	FRAMES	SLACK
FOREPEAK	109-FWD	234179
CTR. NO. 4	85-93	164078
S.W.B. WG. P/S	23-47&50	40862
DOUBLE BOTTOM	32-58	30421
AFTER PEAK	23-AFT	172199

CONSUMABLE LIQUIDS		
TANKS	FRAMES	SLACK
F.O. STOR. P/S	50-61	103124
F.O. SETT. P/S	58-59	1046
L.S.F.O. S	47-50	4314
DIESEL OIL P	47-50	3917
LUBE OIL	–	24
DIST. WATER P	50-58	6367
POT. WATER S	50-58	280

NOTE:
SEE THE FOLLOWING PAGE FOR INSTRUCTIONS.

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TABLE FOR FREE SURFACE CORRECTIONS

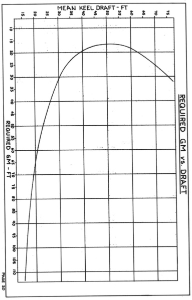
INSTRUCTIONS:

USE THE NUMBER CORRESPONDING TO EACH TANK IN THE TABLE UNLESS THE TANK IS EMPTY OR PRESSED-UP, IN WHICH CASE USE ZERO. DIVIDE THE TOTAL OF THESE NUMBERS BY THE DISPLACEMENT OF THE SHIP IN LONG TONS TO OBTAIN THE FREE SURFACE CORRECTION IN FEET.

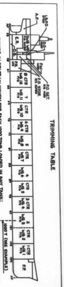
LINEAR INTERPOLATION IN THE TABLE OF CARGO TANK FREE SURFACE CORRECTIONS FOR CARGO DENSITY IS PERMISSIBLE.

THE FREE SURFACE CORRECTIONS FOR TANKS DESIGNATED P/S ARE FOR THE TANK PAIR.

REQUIRED GM vs. DRAFT



TRIMMING TABLE



CHANGE IN DRAFT (IN INCHES) FOR EACH 1000 TONS LOADED IN ANY TANK:

		TANK:	A.P.	SWB WG	D.B.	L.S.F.O., D.O.	F.W.	F.O. SET.	F.O. STOR.	8 CTR	WG 12	WG 11	7 CTR	WG 10	6 CTR, WG 9	WG 8	5 CTR	WG 7	WG 6	4 CTR	WG 5	3 CTR, WG 4	WG 3	2 CTR	WG 2	WG 1	1 CTR	F.P.	
74' DRAFT	FWD		-8.33	-3.52	-3.25	-3.16	-3.00	-2.75	-2.65	-1.99	-1.86	-1.07	-0.67	-0.37	+0.54	+1.54	+1.74	+2.15	+2.95	+3.35	+3.76	+4.56	+5.36	+5.77	+6.16	+6.93	+6.97	+7.72	FWD
	AFT		+7.79	+7.00	+6.79	+6.65	+6.44	+6.25	+6.15	+5.50	+5.38	+4.60	+4.21	+3.81	+3.05	+2.24	+1.84	+1.45	+0.66	+0.26	-0.13	-0.92	-1.71	-2.10	-2.48	-3.25	-3.29	-4.01	AFT
35' DRAFT	FWD		-6.07	-5.08	-4.75	-4.64	-4.45	-4.15	-4.01	-3.14	-3.04	-2.06	-1.57	-1.08	-0.09	+0.90	+1.40	+1.89	+2.88	+3.38	+3.87	+4.86	+5.85	+6.35	+6.83	+7.78	+7.83	+8.75	FWD
	AFT		+10.95	+9.83	+9.45	+9.33	+9.11	+8.76	+8.65	+7.72	+7.55	+6.46	+5.91	+5.36	+4.26	+3.15	+2.60	+2.05	+0.95	+0.39	-0.16	-1.26	-2.36	-2.92	-3.45	-4.52	-4.57	-5.59	AFT

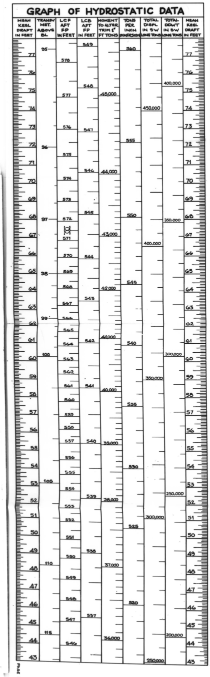
EXAMPLE: FIND CHANGE IN DRAFT AFTER LOADING 1000 TONS IN WING TANK NO. 3

	FORWARD	AFT
ORIGINAL DRAFTS	73'-6 5/8"	74'-1 3/4"
CORRECTION - FROM TABLE MARKED 74' DRAFT	+0'-5 3/8"	-0'-1 3/4"
NEW DRAFTS	74'-0"	74'-0"

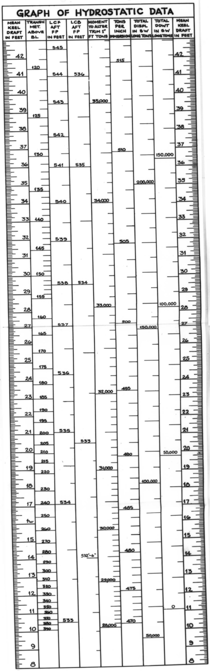
NOTES: 1. THE CORRECTIONS WERE COMPUTED FOR TWO DRAFTS TO FACILITATE INTERPOLATION, BUT IN PRACTICE IT WILL BE SUFFICIENTLY ACCURATE TO REFER TO THE TABLE NEAREST THE SHIP'S DRAFT.

2. WHEN DISCHARGING, USE THE TABLE AS FOR LOADING AND CHANGE THE + AND - SIGNS.

GRAPH OF HYDROSTATIC DATA



GRAPH OF HYDROSTATIC DATA



SUMMARY OF LOADING CONDITIONS

ITEM			COND.# 1	COND.# 2	COND.# 3	COND.# 4	COND.# 5
			LIGHT SHIP	DOCKING	FULL LOAD DEPARTURE 98% F.O.	FULL LOAD ARRIVAL 50% F.O.	FULL LOAD DEPARTURE 50% F.O.
			(TONS)	(TONS)	(TONS)	(TONS)	(TONS)
CARGO NO. 1 CTR			0	0	12079	12079	12337
CARGO NO. 2 CTR			0	0	24133	24133	24647
CARGO NO. 3 CTR			0	0	12047	12047	12304
CARGO NO. 5 CTR			0	0	24066	24066	24517
CARGO NO. 6 CTR			0	0	12023	12023	12279
CARGO NO. 7 CTR			0	0	24052	24052	24564
CARGO NO. 8 CTR			0	0	14827	14827	15143
CARGO NO. 1 WGS	P/S		0	0	13976	13976	14273
CARGO NO. 2 WGS	P/S		0	0	20164	20164	20593
CARGO NO. 3 WGS	P/S		0	0	22258	22258	22732
CARGO NO. 4 WGS	P/S		0	0	22614	22614	23095
CARGO NO. 5 WGS	P/S		0	0	22635	22635	23117
CARGO NO. 6 WGS	P/S		0	0	22635	22685	23117
CARGO NO. 7 WGS	P/S		0	0	22633	22633	23114
CARGO NO. 8 WGS	P/S		0	0	22635	22685	23117
CARGO NO. 9 WGS	P/S		0	0	22635	22635	23117
CARGO NO. 10 WGS	P/S		0	0	22604	22604	23085
CARGO NO. 11 WGS	P/S		0	0	22069	22069	22538
CARGO NO. 12 WGS	P/S		0	0	19554	19554	19970
CARGO TANKS			0	0	379579	379579	387659
F.O. STORAGE	P/S		0	0	16107	7734	7734
F.O. SETTLERS	P/S		0	500	987	987	987
LOW SULFUR F.O.	S		0	100	641	641	641
LUBE OIL			0	64	64	64	64
DIESEL OIL	P		0	100	225	225	225
POTABLE WATER			0	100	162	162	162
DISTILLED WATER			0	100	461	461	461
FOREPEAK			0	5000	0	0	0
NO. 4 CTR			0	17500	0	0	0
S.W. BALLAST WGS	P/S		0	0	0	0	0
DOUBLEBOTTOM			0	0	0	0	0
AFTER PEAK			0	0	0	0	0
CREW & STORES			0	50	50	50	50
DEADWEIGHT			0	23514	398276	389908	397983
LIGHT SHIP			58840	58840	58840	58840	58840
DISPLACEMENT			58840	82354	457116	448743	456823
KEEL DRAFT FORWARD		FT	5.23	14.37	72.40	74.42	75.36
AMIDSHIPS		FT	11.47	15.27	75.03	73.92	75.03
AFT		FT	17.70	16.16	77.65	73.41	74.20
LONGL. C.G. AFT F.P.		FT	604.53	540.39	554.11	546.29	545.98
LONGL. C.B. AFT F.P.		FT	532.30	532.60	547.90	547.40	547.90
TRIMMING LEVER		FT	72.23	7.79	6.21	-1.11	-1.97
MOMENT TO TRIM 1"		FT-TONS	28440	29900	45050	44800	45050
TRIM, + AFT - FWD		FT	12.47	1.79	5.25	-1.01	-1.66
TRANS. KM		FT	354.70	266.00	95.30	95.50	95.30
VERT. C.G. ABV. B.L.		FT	66.50	62.04	52.26	52.09	52.04
GM UNCORRECTED		FT	288.20	203.96	43.04	43.41	43.26
FREE SURF. CORR.		FT	0.00	5.03	3.59	3.66	3.66
GM AVAILABLE		FT	288.20	198.93	39.45	39.75	39.60
GM REQUIRED		FT	—	110.00	29.90	28.60	29.90

SUMMARY OF LOADING CONDITIONS

ITEM			COND.# 6	COND.# 7	COND.# 8	COND.# 9	COND.# 10
			FULL LOAD ARRIVAL 10% F.O.	50% CARGO 98% F.O.	LIGHT BALLAST 76% F.O.	LIGHT BALLAST 50% F.O.	LIGHT CLEANED BALLAST 50% F.O.
			(TONS)	(TONS)	(TONS)	(TONS)	(TONS)
CARGO NO. 1 CTR			12337	0	0	0	0
CARGO NO. 2 CTR			24647	0	0	0	0
CARGO NO. 3 CTR			12304	0	0	0	14000
CARGO NO. 5 CTR			24517	0	0	0	23750
CARGO NO. 6 CTR			12279	0	0	0	15245
CARGO NO. 7 CTR			24564	0	3750	10000	0
CARGO NO. 8 CTR			15143	0	0	0	0
CARGO NO. 1 WGS	P/S		14278	14096	0	0	0
CARGO NO. 2 WGS	P/S		20593	20338	0	0	0
CARGO NO. 3 WGS	P/S		22732	22450	0	0	0
CARGO NO. 4 WGS	P/S		23095	0	0	0	0
CARGO NO. 5 WGS	P/S		23117	22831	0	0	0
CARGO NO. 6 WGS	P/S		23117	22851	0	0	0
CARGO NO. 7 WGS	P/S		23114	22828	20000	20000	0
CARGO NO. 8 WGS	P/S		23117	0	0	0	0
CARGO NO. 9 WGS	P/S		23117	22881	28702	28702	0
CARGO NO. 10 WGS	P/S		23085	22800	0	0	0
CARGO NO. 11 WGS	P/S		22538	22259	0	0	0
CARGO NO. 12 WGS	P/S		19970	0	0	0	4000
CARGO TANKS			387659	193264	52452	58702	52995
F.O. STORAGE	P/S		757	16107	12000	7734	7734
F.O. SETTLERS	P/S		987	987	987	987	987
LOW SULFUR F.O.	S		641	641	641	641	641
LUBE OIL			64	64	64	64	64
DIESEL OIL	P		225	225	225	225	225
POTABLE WATER			162	162	162	62	162
DISTILLED WATER			461	461	461	461	461
FOREPEAK			0	0	13000	13000	4000
NO. 4 CTR			0	0	30533	25000	30533
S.W. BALLAST WGS	P/S		6852	0	0	0	3000
DOUBLEBOTTOM			0	0	0	0	0
AFTER PEAK			0	0	0	0	0
CREW & STORES			50	50	50	50	50
DEADWEIGHT			397858	211961	110375	107026	104852
LIGHT SHIP			58840	58840	58840	58840	58840
DISPLACEMENT			456698	270801	169415	165866	163692
KEEL DRAFT FORWARD		FT	75.38	42.29	21.66	20.69	20.02
AMIDSHIPS		FT	74.99	46.60	30.52	29.96	29.57
AFT		FT	74.59	50.91	39.37	39.23	39.12
LONGL. C.G. AFT F.P.		FT	546.97	551.17	575.83	578.52	580.28
LONGL. C.B. AFT F.P.		FT	547.90	537.23	534.05	533.98	533.90
TRIMMING LEVER		FT	-0.93	13.94	41.78	44.54	46.38
MOMENT TO TRIM 1"		FT-TONS	45050	36480	33300	33200	33130
TRIM, + AFT - FWD		FT	-0.79	+8.62	+17.71	+18.54	+19.10
TRANS. KM		FT	95.30	112.50	150.00	152.30	154.0
VERT. C.G. ABV. B.L.		FT	52.27	53.95	56.36	56.21	57.11
GM UNCORRECTED		FT	43.03	58.55	93.64	96.09	96.89
FREE SURF. CORR.		FT	3.66	3.21	5.54	5.66	6.16
GM AVAILABLE		FT	39.37	55.34	88.10	90.43	90.73
GM REQUIRED		FT	29.75	18.0	31.0	31.0	32.0

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CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO.1			115.85		49.32		
	②	CTR NO.2			223.34		49.30		
	③	CTR NO.3			330.83		49.30		
	④	CTR NO.5			581.67		49.30		
	⑤	CTR NO.6			689.17		49.30		
	⑥	CTR NO.7			796.67		49.30		
	⑦	CTR NO.8			914.00		53.95		
	⑧	WG NO. 1 P/S			119.55		53.81		
	⑨	WG NO. 2 P/S			188.63		50.70		
	⑩	WG NO. 3 P/S			259.37		49.00		
	⑪	WG NO. 4 P/S			330.86		48.40		
	⑫	WG NO. 5 P/S			402.50		48.35		
	⑬	WG NO. 6 P/S			474.17		48.35		
	⑭	WG NO. 7 P/S			545.83		48.35		
	⑮	WG NO. 8 P/S			617.50		48.35		
	⑯	WG NO. 9 P/S			689.17		48.35		
	⑰	WG NO. 10 P/S			760.80		48.42		
	⑱	WG NO. 11 P/S			832.18		49.32		
	⑲	WG NO. 12 P/S			902.87		52.62		
F.O.	⑳	STORAGE P/S			972.81		61.20		
	㉑	SETTLERS P/S			981.64		73.66		
	㉒	LOW SULFUR S			1018.44		70.52		
	㉓	DIESEL OIL P			1018.47		87.70		
	㉔	LUBE OIL			1048.32		92.12		
F.W.	㉕	DISTILLED P			1003.75		86.29		
	㉖	POTABLE S			1005.75		86.29		
S.W.B.	㉗	FOREPEAK			49.79		50.23		
	㉘	CTR NO. 4			438.33		49.30		
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES			1011.00		128.46		
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	
	㉟	TOTALS [SUM ①-㉞]							

CONDITION:

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]		TONS
㊲	TONS PER INCH IMMERSION	[FROM P.22]		
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]		FT
㊴	L.C.B. AFT F.P.	[FROM P.22]		FT
㊵	TRIM LEVER	[㊳-㊴, -FWD/+AFT]		FT
㊶	MOMENT TO TRIM 1"	[FROM P.22]		FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), -FWD/+AFT]		FT
㊸	L.C.F. AFT F.P.	[FROM P.22]		FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P.22]		FT
㊺	TRIM APPLIED FWD	[㊸×㊷÷1143]		FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]		FT
㊼	KEEL DRAFT AFT, S.W.	[㊹+㊺]		FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]		FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☐ YES ☐ NO SEE NOTE 1		

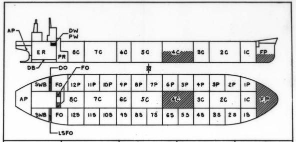
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P.22]		FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]		FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]		FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]		FT
(54)	AVAILABLE GM	[(52)-(53)]		FT
(55)	REQUIRED GM	[FROM P.20]		FT
(56)	IS (54) ≥ (55)?	☐ YES ☐ NO (SEE NOTE 2)		

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY: CARGO OIL ▤ FUEL OIL ▥ S.W. BALLAST ▨ DIESEL OIL ■ FRESH WATER ■	CARGO OIL 0 LT FUEL OIL 600 LT S.W. BALLAST 22500 LT FRESH WATER 200 LT MISC. DWT. 214 LT DEADWEIGHT 23514 LT DISPLACEMENT 82354 LT	LCG AFT FP 540.39 FT TRIM 1.79 FT MT 1" 29900 FT-TON TPI 482.0 DRAFT, FWD 14.37 FT MEAN 15.27 FT AFT 16.16 FT	STABILITY: KM 266.00 FT KG 62.04 FT GM 203.96 FT FREE SURF. CORR. 5.03 FT GM AVAILABLE 198.93 FT GM REQUIRED 110.00 FT	CONDITION: NO. 2 DOCKING

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO.1	95474	12079	115.85	1399352	49.32	595736	49076
	②	CTR NO.2	190795	24133	223.34	5389864	49.30	1189757	98154
	③	CTR NO.3	95220	12047	330.83	3985509	49.30	593917	49076
	④	CTR NO.5	189743	24006	581.67	13963530	49.30	1183496	98154
	⑤	CTR NO.6	95028	12023	689.17	8285991	49.30	592734	49076
	⑥	CTR NO.7	190105	24052	796.67	19161507	49.30	1185764	98154
	⑦	CTR NO.8	117191	14827	914.00	13551878	53.95	799917	71900
	⑧	WG NO. 1 P/S	110462	13976	119.55	1670831	53.81	752049	42744
	⑨	WG NO. 2 P/S	159374	20164	188.63	3803535	50.70	1022315	81284
	⑩	WG NO. 3 P/S	175926	22258	259.37	5773087	49.00	1090642	83306
	⑪	WG NO. 4 P/S	178758	22614	330.86	7482068	48.40	1094518	83306
	⑫	WG NO. 5 P/S	178906	22635	402.50	9110588	48.35	1094402	83306
	⑬	WG NO. 6 P/S	178906	22635	474.17	10732838	48.35	1094402	83306
	⑭	WG NO. 7 P/S	178884	22633	545.83	12353770	48.35	1094305	83306
	⑮	WG NO. 8 P/S	178906	22635	617.50	13977113	48.35	1094402	83306
	⑯	WG NO. 9 P/S	178906	22635	689.17	15599363	48.35	1094402	83306
	⑰	WG NO. 10 P/S	178662	22604	760.80	17197123	48.42	1094486	83306
	⑱	WG NO. 11 P/S	174428	22069	832.18	18365330	49.32	1088443	83306
	⑲	WG NO. 12 P/S	154549	19554	902.87	17654720	52.62	1028931	86640
F.O.	⑳	STORAGE P/S		16107	972.81	15669051	61.20	985748	103124
	㉑	SETTLERS P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR S		641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE S		162	1005.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK			49.79		50.23		
	㉘	CTR NO. 4			438.33		49.30		
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	
	㉟	TOTALS [SUM ①-㉞]		457116	554.11	253291387	52.26	23886942	1642584

CONDITION: NO.3
FULL LOAD DEPARTURE
98% F.O.
CARGO @ 44.38 FT³/LT

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	457116	TONS
㊲	TONS PER INCH IMMERSION	[FROM P.22]	558.00	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	554.11	FT
㊴	L.C.B. AFT F.P.	[FROM P.22]	547.90	FT
㊵	TRIM LEVER	[㊳-㊴, -FWD/+AFT]	6.21	FT
㊶	MOMENT TO TRIM 1"	[FROM P.22]	45050	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), -FWD/+AFT]	5.25	FT
㊸	L.C.F. AFT F.P.	[FROM P.22]	577.10	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P.22]	75.05	FT
㊺	TRIM APPLIED FWD	[㊸×㊷÷1143]	2.65	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	72.40	FT
㊼	KEEL DRAFT AFT, S.W.	[㊹+㊺]	77.65	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	75.03	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

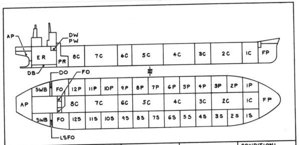
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P.22]	95.30	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	52.26	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	43.04	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	3.59	FT
(54)	AVAILABLE GM	[(52)-(53)]	39.45	FT
(55)	REQUIRED GM	[FROM P.20]	29.90	FT
(56)	IS (54) ≥ (55)?	☒ YES ☐ NO (SEE NOTE 2)		

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY: CARGO OIL ▤ FUEL OIL ▥ S.W. BALLAST ▨ DIESEL OIL ■ FRESH WATER ■	CARGO OIL LT FUEL OIL LT S.W. BALLAST LT FRESH WATER LT MISC. DWT. LT DEADWEIGHT LT DISPLACEMENT LT	LCG AFT FP FT TRIM FT MT 1" FT-TON TPI DRAFT, FWD FT MEAN FT AFT FT	STABILITY: KM FT KG FT GM FT FREE SURF. CORR. FT GM AVAILABLE FT GM REQUIRED FT	CONDITION:

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO.1			115.85		49.32		
	②	CTR NO.2			223.34		49.30		
	③	CTR NO.3			330.83		49.30		
	④	CTR NO.5			581.67		49.30		
	⑤	CTR NO.6			689.17		49.30		
	⑥	CTR NO.7			796.67		49.30		
	⑦	CTR NO.8			914.00		53.95		
	⑧	WG NO. 1 P/S			119.55		53.81		
	⑨	WG NO. 2 P/S			188.63		50.70		
	⑩	WG NO. 3 P/S			259.37		49.00		
	⑪	WG NO. 4 P/S			330.86		48.40		
	⑫	WG NO. 5 P/S			402.50		48.35		
	⑬	WG NO. 6 P/S			474.17		48.35		
	⑭	WG NO. 7 P/S			545.83		48.35		
	⑮	WG NO. 8 P/S			617.50		48.35		
	⑯	WG NO. 9 P/S			689.17		48.35		
	⑰	WG NO. 10 P/S			760.80		48.42		
	⑱	WG NO. 11 P/S			832.18		49.32		
	⑲	WG NO. 12 P/S			902.87		52.62		
F.O.	⑳	STORAGE P/S			972.81		61.20		
	㉑	SETTLERS P/S			981.64		73.66		
	㉒	LOW SULFUR S			1018.44		70.52		
	㉓	DIESEL OIL P			1018.47		87.70		
	㉔	LUBE OIL			1048.32		92.12		
F.W.	㉕	DISTILLED P			1003.75		86.29		
	㉖	POTABLE S			1005.75		86.29		
S.W.B.	㉗	FOREPEAK			49.79		50.23		
	㉘	CTR NO. 4			438.33		49.30		
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES			1011.00		128.46		
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	
	㉟	TOTALS [SUM ①-㉞]		58840	604.53	35570545	66.50	3912860	0

CONDITION: NO. 1
LIGHT SHIP

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	58840	TONS
㊲	TONS PER INCH IMMERSION	[FROM P.22]	472.0	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	604.53	FT
㊴	L.C.B. AFT F.P.	[FROM P.22]	532.30	FT
㊵	TRIM LEVER	[㊳-㊴, -FWD/+AFT]	72.23	FT
㊶	MOMENT TO TRIM 1"	[FROM P.22]	28400	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), -FWD/+AFT]	12.47	FT
㊸	L.C.F. AFT F.P.	[FROM P.22]	535.05	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P.22]	11.05	FT
㊺	TRIM APPLIED FWD	[㊸×㊷÷1143]	5.82	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	5.23	FT
㊼	KEEL DRAFT AFT, S.W.	[㊹+㊺]	17.70	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	11.47	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

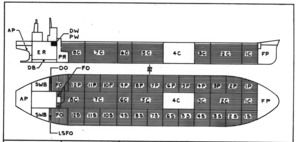
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P.22]	354.70	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	66.50	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	288.20	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	0.	FT
(54)	AVAILABLE GM	[(52)-(53)]	288.20	FT
(55)	REQUIRED GM	[FROM P.20]	—	FT
(56)	IS (54) ≥ (55)?	☐ YES ☐ NO (SEE NOTE 2)		

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

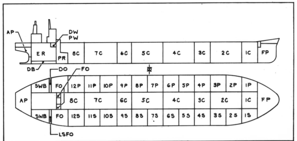
LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY: CARGO OIL ▤ FUEL OIL ▥ S.W. BALLAST ▨ DIESEL OIL ■ FRESH WATER ■	CARGO OIL 379579 LT FUEL OIL 17735 LT S.W. BALLAST 0 LT FRESH WATER 623 LT MISC. DWT. 339 LT DEADWEIGHT 398276 LT DISPLACEMENT 457116 LT	LCG AFT FP 554.11 FT TRIM 5.25 FT MT 1" 45050 FT-TON TPI 558.0 DRAFT, FWD 72.40 FT MEAN 75.03 FT AFT 77.65 FT	STABILITY: KM 95.30 FT KG 52.26 FT GM 43.04 FT FREE SURF. CORR. 3.59 FT GM AVAILABLE 39.45 FT GM REQUIRED 29.90 FT	CONDITION: NO. 3 FULL LOAD DEPARTURE 98% F.O. CARGO @ 44.38 FT³/LT

SUMMARY OF LOADING CONDITIONS

ITEM		COND.# 11 HEAVY CLEANED BALLAST 50% F.O. (TONS)	COND.# (TONS)	COND.# (TONS)	COND.# (TONS)	COND.# (TONS)
CARGO NO. 1 CTR		0				
CARGO NO. 2 CTR		30601				
CARGO NO. 3 CTR		15276				
CARGO NO. 5 CTR		30490				
CARGO NO. 6 CTR		15245				
CARGO NO. 7 CTR		30498				
CARGO NO. 8 CTR		0				
CARGO NO. 1 WGS	P/S	0				
CARGO NO. 2 WGS	P/S	0				
CARGO NO. 3 WGS	P/S	0				
CARGO NO. 4 WGS	P/S	0				
CARGO NO. 5 WGS	P/S	0				
CARGO NO. 6 WGS	P/S	0				
CARGO NO. 7 WGS	P/S	0				
CARGO NO. 8 WGS	P/S	0				
CARGO NO. 9 WGS	P/S	0				
CARGO NO. 10 WGS	P/S	0				
CARGO NO. 11 WGS	P/S	0				
CARGO NO. 12 WGS	P/S	4000				
CARGO TANKS		126060				
F.O. STORAGE	P/S	7734				
F.O. SETTLERS	P/S	987				
LOW SULFUR F.O.	S	641				
LUBE OIL		64				
DIESEL OIL	P	225				
POTABLE WATER		162				
DISTILLED WATER		461				
FOREPEAK		16815				
NO. 4 CTR		30533				
S.W. BALLAST WGS	P/S	6852				
DOUBLEBOTTOM		0				
AFTER PEAK		0				
CREW & STORES		50				
DEADWEIGHT		190384				
LIGHT SHIP		58840				
DISPLACEMENT		249424				
KEEL DRAFT FORWARD	FT	41.63				
AMIDSHIPS	FT	43.07				
AFT	FT	44.51				
LONGL. C.G. AFT F.P.	FT	541.44				
LONGL. C.B. AFT F.P.	FT	536.49				
TRIMMING LEVER	FT	4.95				
MOMENT TO TRIM 1"	FT-TONS	35720				
TRIM, +AFT -FWD	FT	2.88				
TRANS. KM	FT	117.60				
VERT. C.G. ABV. B.L.	FT	54.87				
GM UNCORRECTED	FT	62.73				
FREE SURF. CORR.	FT	4.63				
GM AVAILABLE	FT	58.10				
GM REQUIRED	FT	18.00				



LOADING KEY: CARGO OIL ▤ FUEL OIL ▥ S.W. BALLAST ▨ DIESEL OIL ■ FRESH WATER ■	CARGO OIL 0 LT FUEL OIL 0 LT S.W. BALLAST 0 LT FRESH WATER 0 LT MISC. DWT. 0 LT DEADWEIGHT 0 LT DISPLACEMENT 58840 LT	LCG AFT FP 604.53 FT TRIM 12.47 FT MT 1" 28400 FT-TON TPI 472.0 DRAFT, FWD 5.23 FT MEAN 11.47 FT AFT 17.70 FT	STABILITY: KM 354.70 FT KG 66.50 FT GM 288.20 FT FREE SURF. CORR. 0. FT GM AVAILABLE 288.20 FT GM REQUIRED FT	CONDITION: NO. 1 LIGHT SHIP

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO.1			115.85		49.32		
	②	CTR NO.2			223.34		49.30		
	③	CTR NO.3			330.83		49.30		
	④	CTR NO.5			581.67		49.30		
	⑤	CTR NO.6			689.17		49.30		
	⑥	CTR NO.7			796.67		49.30		
	⑦	CTR NO.8			914.00		53.95		
	⑧	WG NO. 1 P/S			119.55		53.81		
	⑨	WG NO. 2 P/S			188.63		50.70		
	⑩	WG NO. 3 P/S			259.37		49.00		
	⑪	WG NO. 4 P/S			330.86		48.40		
	⑫	WG NO. 5 P/S			402.50		48.35		
	⑬	WG NO. 6 P/S			474.17		48.35		
	⑭	WG NO. 7 P/S			545.83		48.35		
	⑮	WG NO. 8 P/S			617.50		48.35		
	⑯	WG NO. 9 P/S			689.17		48.35		
	⑰	WG NO. 10 P/S			760.80		48.42		
	⑱	WG NO. 11 P/S			832.18		49.32		
	⑲	WG NO. 12 P/S			902.87		52.62		
F.O.	⑳	STORAGE P/S			972.81		61.20		
	㉑	SETTLERS P/S		500	981.64	490820	73.66	36830	1046
	㉒	LOW SULFUR S		100	1018.44	101844	70.52	7052	4314
	㉓	DIESEL OIL P		100	1018.47	101847	87.70	8770	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		100	1003.75	100375	86.29	8629	6367
	㉖	POTABLE S		100	1005.75	100575	86.29	8629	280
S.W.B.	㉗	FOREPEAK		5000	49.79	248950	50.23	251150	234179
	㉘	CTR NO. 4		17500	438.33	7670775	49.30	862750	164018
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	
	㉟	TOTALS [SUM ①-㉞]		82354	540.39	44503173	62.04	5108989	414205

CONDITION: NO. 2
DOCKING

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	82354	TONS
㊲	TONS PER INCH IMMERSION	[FROM P.22]	482.0	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	540.39	FT
㊴	L.C.B. AFT F.P.	[FROM P.22]	532.60	FT
㊵	TRIM LEVER	[㊳-㊴, -FWD/+AFT]	7.79	FT
㊶	MOMENT TO TRIM 1"	[FROM P.22]	29900	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), -FWD/+AFT]	1.79	FT
㊸	L.C.F. AFT F.P.	[FROM P.22]	533.62	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P.22]	15.20	FT
㊺	TRIM APPLIED FWD	[㊸×㊷÷1143]	0.83	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	14.37	FT
㊼	KEEL DRAFT AFT, S.W.	[㊹+㊺]	16.16	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	15.27	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P.22]	266.00	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	62.04	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	203.96	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	5.03	FT
(54)	AVAILABLE GM	[(52)-(53)]	198.93	FT
(55)	REQUIRED GM	[FROM P.20]	110.00	FT
(56)	IS (54) ≥ (55)?	☒ YES ☐ NO (SEE NOTE 2)		

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S

MICRO-MASTER® 105 mm
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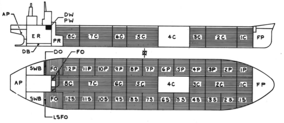
SEPT. '80

8X

FRAME

0100-1303



LOADING KEY:	CARGO OIL 379579 LT	LCG AFT FP 546.29 FT	STABILITY:	CONDITION: NO. 4
CARGO OIL ▤	FUEL OIL 9362 LT	TRIM -1.01 FT	KM 95.50 FT	FULL LOAD ARRIVAL
FUEL OIL ▥	S.W. BALLAST 0 LT	MT 1" 44800 FT-TON	KG 52.09 FT	50% F.O.
S.W. BALLAST ▨	FRESH WATER 623 LT	TPI 557.0	GM 43.41 FT	CARGO @ 44.38 FT³/LT
DIESEL OIL ■	MISC. DWT. 339 LT	DRAFT, FWD 74.42 FT	FREE SURF. CORR. 3.66 FT	
FRESH WATER ■	DEADWEIGHT 389903 LT	MEAN 73.92 FT	GM AVAILABLE 39.75 FT	
	DISPLACEMENT 448743 LT	AFT 73.41 FT	GM REQUIRED 28.60 FT	

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO. 1	95474	12079	115.85	1399352	49.32	595736	49076
	②	CTR NO. 2	190745	24133	223.36	5390347	49.30	1189757	98154
	③	CTR NO. 3	95220	12047	330.83	3985509	49.30	593917	49076
	④	CTR NO. 5	189743	24006	581.67	13963570	49.30	1183496	98154
	⑤	CTR NO. 6	95028	12023	689.17	8285891	49.30	592734	49076
	⑥	CTR NO. 7	190105	24052	796.67	19161507	49.30	1185764	98156
	⑦	CTR NO. 8	117191	14827	914.00	13551878	53.95	799917	71900
	⑧	WG NO. 1 P/S	110462	13976	119.35	1670831	53.81	752049	42744
	⑨	WG NO. 2 P/S	159574	20164	188.63	3803535	50.70	1022315	81284
	⑩	WG NO. 3 P/S	175924	22258	259.31	5773057	49.00	1090642	88806
	⑪	WG NO. 4 P/S	178738	22614	330.86	7482068	48.40	1094518	88806
	⑫	WG NO. 5 P/S	178906	22635	402.50	9110588	48.35	1094402	88806
	⑬	WG NO. 6 P/S	178906	22635	474.17	10732928	48.35	1094402	88806
	⑭	WG NO. 7 P/S	178884	22633	545.83	12353770	48.35	1094305	88806
	⑮	WG NO. 8 P/S	178906	22635	617.50	13977113	48.35	1094402	88806
	⑯	WG NO. 9 P/S	178906	22635	689.17	15599363	48.35	1094402	88806
	⑰	WG NO. 10 P/S	178662	22606	760.80	17197123	48.42	1094486	88806
	⑱	WG NO. 11 P/S	174428	22069	832.18	18365380	49.32	1088443	88806
	⑲	WG NO. 12 P/S	154549	19554	902.87	17654720	52.62	1028931	86640
F.O.	⑳	STORAGE	P/S	7734	972.81	7523713	61.20	473321	103124
	㉑	SETTLERS	P/S	987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR	S	641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL	P	225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED	P	461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE	S	162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK			49.79		50.23		
	㉘	CTR NO. 4			438.33		49.30		
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	═
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	═
	㉟	TOTALS [SUM ①-㉞]		448743	546.29	245146049	52.09	23374515	1642534

CONDITION: NO. 4
FULL LOAD ARRIVAL
50% F.O.
CARGO @ 44.38 FT³/LT

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	448743	TONS
㊲	TONS PER INCH IMMERSION	[FROM P.22]	557.00	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	546.29	FT
㊴	L.C.B. AFT F.P.	[FROM P.22]	547.40	FT
㊵	TRIM LEVER	[㊳-㊴, −FWD +AFT]	-1.11	FT
㊶	MOMENT TO TRIM 1"	[FROM P.22]	44800	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), −FWD +AFT]	-1.01	FT
㊸	L.C.F. AFT F.P.	[FROM P.22]	576.50	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P.22]	73.91	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	-0.51	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	74.42	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	73.41	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	73.92	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?		☒ YES ☐ NO SEE NOTE 1	

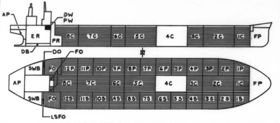
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P.22]	95.50	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	52.09	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	43.41	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	3.66	FT
(54)	AVAILABLE GM	[(52)-(53)]	39.75	FT
(55)	REQUIRED GM	[FROM P.20]	28.60	FT
(56)	IS (54) ≥ (55)?	☒ YES ☐ NO (SEE NOTE 2)		

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:	CARGO OIL 387659 LT	LCG AFT FP 545.93 FT	STABILITY:	CONDITION: NO. 5
CARGO OIL ▤	FUEL OIL 9362 LT	TRIM -1.66 FT	KM 95.30 FT	FULL LOAD DEPARTURE
FUEL OIL ▥	S.W. BALLAST 0 LT	MT 1" 45050 FT-TON	KG 52.04 FT	50% F.O.
S.W. BALLAST ▨	FRESH WATER 623 LT	TPI 558.0	GM 43.26 FT	CARGO @ 43.46 FT³/LT
DIESEL OIL ■	MISC. DWT. 339 LT	DRAFT, FWD 75.86 FT	FREE SURF. CORR. 3.66 FT	
FRESH WATER ■	DEADWEIGHT 397983 LT	MEAN 75.03 FT	GM AVAILABLE 39.60 FT	
	DISPLACEMENT 456823 LT	AFT 74.20 FT	GM REQUIRED 29.90 FT	

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO. 1	95974	12357	115.85	1429241	49.32	608461	50002
	②	CTR NO. 2	190748	24647	223.36	5504661	49.30	1215097	100006
	③	CTR NO. 3	95220	12304	330.83	4070532	49.30	606587	50002
	④	CTR NO. 5	189743	24517	581.67	14260803	49.30	1208688	100006
	⑤	CTR NO. 6	95028	12279	689.17	8462318	49.30	605355	50002
	⑥	CTR NO. 7	190105	24564	796.67	19569402	49.30	1211005	100006
	⑦	CTR NO. 8	117191	15143	914.00	13840702	53.95	816965	73256
	⑧	WG NO. 1 P/S	110462	14273	119.35	1706337	53.81	768030	43551
	⑨	WG NO. 2 P/S	159574	20593	188.63	3884458	50.70	1044065	82817
	⑩	WG NO. 3 P/S	175924	22732	259.31	5894999	49.00	1113868	90482
	⑪	WG NO. 4 P/S	178738	23095	330.86	7641212	48.40	1117798	90482
	⑫	WG NO. 5 P/S	178906	23117	402.50	9304593	48.35	1117707	90482
	⑬	WG NO. 6 P/S	178906	23117	474.17	10961388	48.35	1117707	90482
	⑭	WG NO. 7 P/S	178884	23114	545.83	12616315	48.35	1117562	90482
	⑮	WG NO. 8 P/S	178906	23117	617.50	14274748	48.35	1117707	90482
	⑯	WG NO. 9 P/S	178906	23117	689.17	15931543	48.35	1117707	90482
	⑰	WG NO. 10 P/S	178660	23085	760.80	17563068	48.42	1117776	90482
	⑱	WG NO. 11 P/S	174428	22538	832.18	18755673	49.32	1111547	90482
	⑲	WG NO. 12 P/S	154549	19970	902.87	18030814	52.62	1050821	88279
F.O.	⑳	STORAGE	P/S	7734	972.81	7523713	61.20	473321	103124
	㉑	SETTLERS	P/S	987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR	S	641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL	P	225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED	P	461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE	S	162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK			49.79		50.23		
	㉘	CTR NO. 4			438.33		49.30		
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	═
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	═
	㉟	TOTALS [SUM ①-㉞]		456823	545.93	249391399	52.04	23774877	1671337

CONDITION: NO. 5
FULL LOAD DEPARTURE
50% F.O.
CARGO @ 43.46 FT³/LT

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	456823	TONS
㊲	TONS PER INCH IMMERSION	[FROM P.22]	558.00	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	545.93	FT
㊴	L.C.B. AFT F.P.	[FROM P.22]	547.90	FT
㊵	TRIM LEVER	[㊳-㊴, −FWD +AFT]	-1.97	FT
㊶	MOMENT TO TRIM 1"	[FROM P.22]	45050	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), −FWD +AFT]	-1.66	FT
㊸	L.C.F. AFT F.P.	[FROM P.22]	577.10	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P.22]	75.02	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	-0.84	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	75.86	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	74.20	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	75.03	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?		☒ YES ☐ NO SEE NOTE 1	

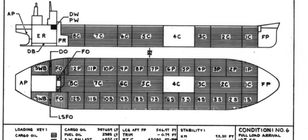
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P.22]	95.30	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	52.04	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	43.26	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	3.66	FT
(54)	AVAILABLE GM	[(52)-(53)]	39.60	FT
(55)	REQUIRED GM	[FROM P.20]	29.90	FT
(56)	IS (54) ≥ (55)?	☒ YES ☐ NO (SEE NOTE 2)		

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:	CARGO OIL 387659 LT	LCG AFT FP 546.97 FT	STABILITY:	CONDITION: NO. 6
CARGO OIL ▤	FUEL OIL 2385 LT	TRIM -0.79 FT	KM 95.30 FT	FULL LOAD ARRIVAL
FUEL OIL ▥	S.W. BALLAST 6852 LT	MT 1" 45050 FT-TON	KG 52.27 FT	10% F.O.
S.W. BALLAST ▨	FRESH WATER 623 LT	TPI 557.90	GM 43.03 FT	CARGO @ 43.46 FT³/LT
DIESEL OIL ■	MISC. DWT. 339 LT	DRAFT, FWD 75.38 FT	FREE SURF. CORR. 3.66 FT	
FRESH WATER ■	DEADWEIGHT 397858 LT	MEAN 74.99 FT	GM AVAILABLE 39.37 FT	
	DISPLACEMENT 456698 LT	AFT 74.59 FT	GM REQUIRED 29.75 FT	

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO. 1	95974	12357	115.85	1429241	49.32	608461	50002
	②	CTR NO. 2	190748	24647	223.36	5504661	49.30	1215097	100006
	③	CTR NO. 3	95220	12304	330.83	4070532	49.30	606587	50002
	④	CTR NO. 5	189743	24517	581.67	14260803	49.30	1208688	100006
	⑤	CTR NO. 6	95028	12279	689.17	8462318	49.30	605355	50002
	⑥	CTR NO. 7	190105	24564	796.67	19569402	49.30	1211005	100006
	⑦	CTR NO. 8	117191	15143	914.00	13840702	53.95	816965	73256
	⑧	WG NO. 1 P/S	110462	14273	119.35	1706337	53.81	768030	43551
	⑨	WG NO. 2 P/S	159574	20593	188.63	3884458	50.70	1044065	82817
	⑩	WG NO. 3 P/S	175924	22732	259.31	5895999	49.00	1113868	90482
	⑪	WG NO. 4 P/S	178738	23095	330.86	7641212	48.40	1117798	90482
	⑫	WG NO. 5 P/S	178906	23117	402.50	9304593	48.35	1117707	90482
	⑬	WG NO. 6 P/S	178906	23117	474.17	10961388	48.35	1117707	90482
	⑭	WG NO. 7 P/S	178884	23114	545.83	12616315	48.35	1117562	90482
	⑮	WG NO. 8 P/S	178906	23117	617.50	14274748	48.35	1117707	90482
	⑯	WG NO. 9 P/S	178906	23117	689.17	15931543	48.35	1117707	90482
	⑰	WG NO. 10 P/S	178660	23085	760.80	17563068	48.42	1117776	90482
	⑱	WG NO. 11 P/S	174428	22538	832.18	18755673	49.32	1111574	90482
	⑲	WG NO. 12 P/S	154549	19970	902.87	18030814	52.62	1050821	88279
F.O.	⑳	STORAGE	P/S	757	972.81	736417	61.20	46328	103124
	㉑	SETTLERS	P/S	987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR	S	641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL	P	225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED	P	461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE	S	162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK			49.79		50.23		
	㉘	CTR NO. 4			438.33		49.30		
	㉙	S.W. BALLAST WG P		3640	1048.60	3816904	75.43	274565	—
	㉚	S.W. BALLAST WG S		3212	1052.62	3381015	77.51	248962	—
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	═
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	═
	㉟	TOTALS [SUM ①-㉞]		456698	546.97	249802022	52.27	23870910	1671337

CONDITION: NO. 6
FULL LOAD ARRIVAL
10% F.O.
CARGO @ 43.46 FT³/LT

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	456698	TONS
㊲	TONS PER INCH IMMERSION	[FROM P.22]	557.90	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	546.97	FT
㊴	L.C.B. AFT F.P.	[FROM P.22]	547.90	FT
㊵	TRIM LEVER	[㊳-㊴, −FWD +AFT]	-0.93	FT
㊶	MOMENT TO TRIM 1"	[FROM P.22]	45050	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), −FWD +AFT]	-0.79	FT
㊸	L.C.F. AFT F.P.	[FROM P.22]	577.20	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P.22]	74.98	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	-0.40	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	75.38	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	74.59	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	74.99	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?		☒ YES ☐ NO SEE NOTE 1	

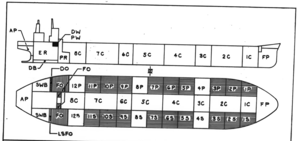
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P.22]	95.30	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	52.27	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	43.03	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	3.66	FT
(54)	AVAILABLE GM	[(52)-(53)]	39.37	FT
(55)	REQUIRED GM	[FROM P.20]	29.75	FT
(56)	IS (54) ≥ (55)?	☒ YES ☐ NO (SEE NOTE 2)		

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:	CARGO OIL 193264 LT	LCG AFT FP 551.17 FT	STABILITY:	CONDITION: NO. 7
CARGO OIL ▤	FUEL OIL 17735 LT	TRIM 8.62 FT	KM 112.50 FT	50% CARGO
FUEL OIL ▥	S.W. BALLAST 0 LT	MT 1" 36480 FT-TON	KG 53.96 FT	98% F.O.
S.W. BALLAST ▨	FRESH WATER 623 LT	TPI 520.2	GM 58.55 FT	CARGO @ 44.00 FT³/LT
DIESEL OIL ■	MISC. DWT. 339 LT	DRAFT, FWD 42.29 FT	FREE SURF. CORR. 3.21 FT	
FRESH WATER ■	DEADWEIGHT 211961 LT	MEAN 46.60 FT	GM AVAILABLE 55.34 FT	
	DISPLACEMENT 270801 LT	AFT 50.91 FT	GM REQUIRED 18. FT	

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO. 1			115.85		49.32		
	②	CTR NO. 2			223.36		49.30		
	③	CTR NO. 3			330.83		49.30		
	④	CTR NO. 5			581.67		49.30		
	⑤	CTR NO. 6			689.17		49.30		
	⑥	CTR NO. 7			796.67		49.30		
	⑦	CTR NO. 8			914.00		53.95		
	⑧	WG NO. 1 P/S	110462	14096	119.35	1685177	53.81	758506	43017
	⑨	WG NO. 2 P/S	159574	20338	188.63	3836357	50.70	1031137	81801
	⑩	WG NO. 3 P/S	175924	22450	259.31	5821510	49.00	1100050	89872
	⑪	WG NO. 4 P/S			330.86		48.40		
	⑫	WG NO. 5 P/S	178906	22831	402.50	9189478	48.35	1103879	89372
	⑬	WG NO. 6 P/S	178906	22831	474.17	10825775	48.35	1103879	89372
	⑭	WG NO. 7 P/S	178884	22828	545.83	12460207	48.35	1103734	89372
	⑮	WG NO. 8 P/S			617.50		48.35		
	⑯	WG NO. 9 P/S	178906	22831	689.17	15734440	48.35	1103879	89372
	⑰	WG NO. 10 P/S	178662	22800	760.80	17346240	48.42	1103976	89372
	⑱	WG NO. 11 P/S	174428	22254	832.18	18519495	49.32	1097567	89372
	⑲	WG NO. 12 P/S			902.87		52.62		
F.O.	⑳	STORAGE	P/S	16107	972.81	15669051	61.20	985748	103124
	㉑	SETTLERS	P/S	987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR	S	641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL	P	225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED	P	461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE	S	162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK			49.79		50.23		
	㉘	CTR NO. 4			438.33		49.30		
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	═
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	═
	㉟	TOTALS [SUM ①-㉞]		270801	551.17	149257456	53.95	14609178	869494

CONDITION: NO. 7
50% CARGO
98% F.O.
CARGO @ 44.00 FT³/LT

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	270801	TONS
㊲	TONS PER INCH IMMERSION	[FROM P.22]	520.2	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	551.17	FT
㊴	L.C.B. AFT F.P.	[FROM P.22]	537.23	FT
㊵	TRIM LEVER	[㊳-㊴, −FWD +AFT]	13.94	FT
㊶	MOMENT TO TRIM 1"	[FROM P.22]	36480	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), −FWD +AFT]	8.62	FT
㊸	L.C.F. AFT F.P.	[FROM P.22]	548.00	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P.22]	46.42	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	4.13	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	42.29	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	50.91	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	46.60	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?		☒ YES ☐ NO SEE NOTE 1	

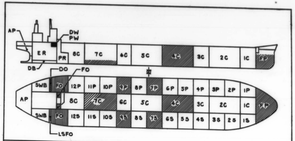
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P.22]	112.50	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	53.95	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	58.55	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	3.21	FT
(54)	AVAILABLE GM	[(52)-(53)]	55.34	FT
(55)	REQUIRED GM	[FROM P.20]	18.	FT
(56)	IS (54) ≥ (55)?	☒ YES ☐ NO (SEE NOTE 2)		

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:	CARGO OIL 0 LT	LCG AFT FP 575.83 FT	STABILITY:	CONDITION: NO. 8
CARGO OIL ▤	FUEL OIL 13628 LT	TRIM 17.71 FT	KM 150.0 FT	LIGHT BALLAST
FUEL OIL ▥	S.W. BALLAST 95985 LT	MT 1" 33300 FT-TON	KG 56.36 FT	76 % F.O.
S.W. BALLAST ▨	FRESH WATER 623 LT	TPI 503.1	GM 93.64 FT	
DIESEL OIL ■	MISC. DWT. 339 LT	DRAFT, FWD 21.66 FT	FREE SURF. CORR. 5.54 FT	
FRESH WATER ■	DEADWEIGHT 110575 LT	MEAN 30.52 FT	GM AVAILABLE 88.10 FT	
	DISPLACEMENT 169415 LT	AFT 39.37 FT	GM REQUIRED 31.0 FT	

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8X

FRAME

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO.1			115.85		49.32		
	②	CTR NO.2			223.34		49.30		
	③	CTR NO.3			330.83		49.30		
	④	CTR NO.5			581.67		49.30		
	⑤	CTR NO.6			689.17		49.30		
	⑥	CTR NO.7		3750	796.67	2987513	49.30	184875	164078
	⑦	CTR NO.8			914.00		53.95		
	⑧	WG NO. 1 P/S			119.55		53.81		
	⑨	WG NO. 2 P/S			188.63		50.70		
	⑩	WG NO. 3 P/S			259.37		49.00		
	⑪	WG NO. 4 P/S			330.86		48.40		
	⑫	WG NO. 5 P/S			402.50		48.35		
	⑬	WG NO. 6 P/S			474.17		48.35		
	⑭	WG NO. 7 P/S		20000	545.83	10916600	48.35	967000	145204
	⑮	WG NO. 8 P/S			617.50		48.35		
	⑯	WG NO. 9 P/S		28702	689.17	19780557	48.35	1387742	112353
	⑰	WG NO. 10 P/S			760.80		48.42		
	⑱	WG NO. 11 P/S			832.18		49.32		
	⑲	WG NO. 12 P/S			902.87		52.62		
F.O.	⑳	STORAGE P/S		12000	972.81	11673720	61.20	734400	108124
	㉑	SETTLERS P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR S		641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE S		162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK		13000	49.79	647270	50.23	652990	234179
	㉘	CTR NO. 4		30533	438.33	13383550	49.30	1505277	164078
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	——
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	——
	㉟	TOTALS [SUM ①-㉞]		169415	575.83	97553569	56.36	9548860	938934

CONDITION: NO. 8
LIGHT BALLAST
70 % F.O.

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	169415	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	503.1	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	575.83	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	534.05	FT
㊵	TRIM LEVER	[㊳-㊴, -FWD/+AFT]	41.78	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	33300	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), -FWD/+AFT]	17.71	FT
㊸	L.C.F. AFT F.P.	[FROM P.22]	538.20	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P.22]	30.00	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	8.34	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	21.66	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	39.37	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	30.52	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

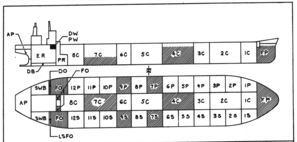
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	150.00	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	56.36	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	93.64	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	5.54	FT
(54)	AVAILABLE GM	[(52)-(53)]	88.10	FT
(55)	REQUIRED GM	[FROM P. 20]	31.	FT
(56)	IS (54) ≥ (55)? ☒ YES ☐ NO (SEE NOTE 2)			

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:

CARGO OIL	▤
FUEL OIL	▥
S.W. BALLAST	▨
DIESEL OIL	■
FRESH WATER	■

CARGO OIL	0	LT
FUEL OIL	9362	LT
S.W. BALLAST	96702	LT
FRESH WATER	623	LT
MISC. DWT.	339	LT
DEADWEIGHT	107026	LT
DISPLACEMENT	165866	LT

LCG AFT FP	578.52	FT
TRIM	18.54	FT
MT 1"	33200	FT-TON
TPI	502.5	
DRAFT, FWD	20.69	FT
MEAN	29.96	FT
AFT	39.23	FT

STABILITY:

KM	152.53	FT
KG	56.21	FT
GM	96.09	FT
FREE SURF. CORR.	5.66	FT
GM AVAILABLE	90.43	FT
GM REQUIRED	31.0	FT

CONDITION: NO. 9
LIGHT BALLAST
50% F.O.

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO.1			115.85		49.32		
	②	CTR NO.2			223.34		49.30		
	③	CTR NO.3			330.83		49.30		
	④	CTR NO.5			581.67		49.30		
	⑤	CTR NO.6			689.17		49.30		
	⑥	CTR NO.7		10000	796.67	7966700	49.30	493000	164078
	⑦	CTR NO.8			914.00		53.95		
	⑧	WG NO. 1 P/S			119.55		53.81		
	⑨	WG NO. 2 P/S			188.63		50.70		
	⑩	WG NO. 3 P/S			259.37		49.00		
	⑪	WG NO. 4 P/S			330.86		48.40		
	⑫	WG NO. 5 P/S			402.50		48.35		
	⑬	WG NO. 6 P/S			474.17		48.35		
	⑭	WG NO. 7 P/S		20000	545.83	10916600	48.35	967000	145204
	⑮	WG NO. 8 P/S			617.50		48.35		
	⑯	WG NO. 9 P/S		28702	689.17	19780557	48.35	1387742	112353
	⑰	WG NO. 10 P/S			760.80		48.42		
	⑱	WG NO. 11 P/S			832.18		49.32		
	⑲	WG NO. 12 P/S			902.87		52.62		
F.O.	⑳	STORAGE P/S		7734	972.81	7523713	61.20	473321	108124
	㉑	SETTLERS P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR S		641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE S		162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK		13000	49.79	647270	50.23	652990	234179
	㉘	CTR NO. 4		25000	438.33	10958250	49.30	1232500	164078
	㉙	S.W. BALLAST WG P			1048.60		75.43		
	㉚	S.W. BALLAST WG S			1052.62		77.51		
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	——
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	——
	㉟	TOTALS [SUM ①-㉞]		165866	578.52	95957469	56.21	9323129	932764

CONDITION: NO. 9
LIGHT BALLAST
50% F.O.

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	165866	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	502.5	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	578.52	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	533.98	FT
㊵	TRIM LEVER	[㊳-㊴, -FWD/+AFT]	44.54	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	33200	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), -FWD/+AFT]	18.54	FT
㊸	L.C.F. AFT F.P.	[FROM P.22]	537.95	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P.22]	29.42	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	8.73	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	20.69	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	39.23	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	29.96	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

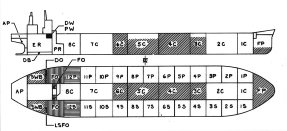
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	152.30	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	56.21	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	96.09	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	5.66	FT
(54)	AVAILABLE GM	[(52)-(53)]	90.43	FT
(55)	REQUIRED GM	[FROM P. 20]	31.	FT
(56)	IS (54) ≥ (55)? ☒ YES ☐ NO (SEE NOTE 2)			

NOTE 2: IF LINE (56) IS ANSWERED "NO" CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:

CARGO OIL	▤
FUEL OIL	▥
S.W. BALLAST	▨
DIESEL OIL	■
FRESH WATER	■

CARGO OIL	4000	LT
FUEL OIL	9362	LT
S.W. BALLAST	90528	LT
FRESH WATER	623	LT
MISC. DWT.	339	LT
DEADWEIGHT	104852	LT
DISPLACEMENT	163692	LT

LCG AFT FP	580.28	FT
TRIM	19.10	FT
MT 1"	33130	FT-TON
TPI	502.0	
DRAFT, FWD	20.02	FT
MEAN	29.57	FT
AFT	39.12	FT

STABILITY:

KM	154.00	FT
KG	57.11	FT
GM	96.89	FT
FREE SURF. CORR.	6.16	FT
GM AVAILABLE	90.73	FT
GM REQUIRED	32.0	FT

CONDITION: NO. 10
LIGHT CLEANED
BALLAST WITH SLOPS
50% F.O.

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO.1			115.85		49.32		
	②	CTR NO.2			223.34		49.30		
	③	CTR NO.3		14000	330.83	4631620	49.30	690200	82021
	④	CTR NO.5		23750	581.67	13814663	49.30	1170875	164078
	⑤	CTR NO.6		15245	689.17	10506397	49.30	751579	62089
	⑥	CTR NO.7			796.67		49.30		
	⑦	CTR NO.8			914.00		53.95		
	⑧	WG NO. 1 P/S			119.55		53.81		
	⑨	WG NO. 2 P/S			188.63		50.70		
	⑩	WG NO. 3 P/S			259.37		49.00		
	⑪	WG NO. 4 P/S			330.86		48.40		
	⑫	WG NO. 5 P/S			402.50		48.35		
	⑬	WG NO. 6 P/S			474.17		48.35		
	⑭	WG NO. 7 P/S			545.83		48.35		
	⑮	WG NO. 8 P/S			617.50		48.35		
	⑯	WG NO. 9 P/S			689.17		48.35		
	⑰	WG NO. 10 P/S			760.80		48.42		
	⑱	WG NO. 11 P/S			832.18		49.32		
	⑲	WG NO. 12 P/S		4000	902.87	3611480	52.62	210480	141668
F.O.	⑳	STORAGE P/S		7734	972.81	7523713	61.20	473321	108124
	㉑	SETTLERS P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR S		641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE S		162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK		4000	49.79	199160	50.23	200920	234179
	㉘	CTR NO. 4		30533	438.33	13383550	49.30	1505277	164078
	㉙	S.W. BALLAST WG P		1500	1048.60	1572900	75.43	113145	20431
	㉚	S.W. BALLAST WG S		1500	1052.62	1578930	77.51	116265	20431
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	——
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	——
	㉟	TOTALS [SUM ①-㉞]		163692	580.28	94986772	57.11	9398638	1008065

CONDITION: NO. 10
LIGHT CLEANED BALLAST WITH SLOPS
50% F.O.

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	163692	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	502.	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	580.28	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	533.90	FT
㊵	TRIM LEVER	[㊳-㊴, -FWD/+AFT]	46.38	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	33130	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), -FWD/+AFT]	19.10	FT
㊸	L.C.F. AFT F.P.	[FROM P.22]	537.75	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P.22]	29.00	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	8.98	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	20.02	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	39.12	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	29.57	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

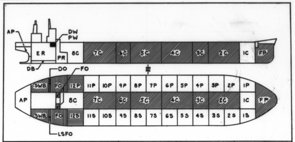
NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	154.00	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	57.11	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	96.89	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	6.16	FT
(54)	AVAILABLE GM	[(52)-(53)]	90.73	FT
(55)	REQUIRED GM	[FROM P. 20]	32.0	FT
(56)	IS (54) ≥ (55)? ☒ YES ☐ NO (SEE NOTE 2)			

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S



LOADING KEY:

CARGO OIL	▤
FUEL OIL	▥
S.W BALLAST	▨
DIESEL OIL	■
FRESH WATER	■

CARGO OIL	4000	LT
FUEL OIL	9362	LT
S.W. BALLAST	176260	LT
FRESH WATER	623	LT
MISC DWT	339	LT
DEADWEIGHT	190584	LT
DISPLACEMENT	249424	LT

LCG AFT FP	541.44	FT
TRIM	2.88	FT
MT 1"	35720	FT-TON
TPI		
DRAFT, FWD	41.63	FT
MEAN	43.07	FT
AFT	44.51	FT

STABILITY:

KM	117.60	FT
KG	54.87	FT
GM	62.73	FT
FREE SURF. CORR.	4.63	FT
GM AVAILABLE	58.10	FT
GM REQUIRED	18.00	FT

CONDITION: NO. 11
HEAVY CLEANED
BALLAST WITH SLOPS
50 % F.O.

CONTENT	LINE NO.	TANK	(A) BARRELS	(B) TONS	(C) L.C.G. AFT F.P.	(D) L.C.G. MOMENT (B)×(C)	(E) V.C.G. ABV. B.L.	(F) V.C.G. MOMENT (B)×(E)	(G) FREE SURF. (SEE P.18)
CARGO OR S.W. BALLAST	①	CTR NO.1			115.85		49.32		
	②	CTR NO.2		30601	223.34	6834427	49.30	1508629	124178
	③	CTR NO.3		15276	330.83	5053759	49.30	753107	62089
	④	CTR NO.5		30440	581.67	17706035	49.30	1500692	124178
	⑤	CTR NO.6		15245	689.17	10506397	49.30	751579	62089
	⑥	CTR NO.7		30498	796.67	24296842	49.30	1503551	124178
	⑦	CTR NO.8			914.00		53.95		
	⑧	WG NO. 1 P/S			119.55		53.81		
	⑨	WG NO. 2 P/S			188.63		50.70		
	⑩	WG NO. 3 P/S			259.37		49.00		
	⑪	WG NO. 4 P/S			330.86		48.40		
	⑫	WG NO. 5 P/S			402.50		48.35		
	⑬	WG NO. 6 P/S			474.17		48.35		
	⑭	WG NO. 7 P/S			545.83		48.35		
	⑮	WG NO. 8 P/S			617.50		48.35		
	⑯	WG NO. 9 P/S			689.17		48.35		
	⑰	WG NO. 10 P/S			760.80		48.42		
	⑱	WG NO. 11 P/S			832.18		49.32		
	⑲	WG NO. 12 P/S		4000	902.87	3611480	52.62	210480	141668
F.O.	⑳	STORAGE P/S		7734	972.81	7523713	61.20	473321	108124
	㉑	SETTLERS P/S		987	981.64	968879	73.66	72702	1046
	㉒	LOW SULFUR S		641	1018.44	652820	70.52	45203	4314
	㉓	DIESEL OIL P		225	1018.47	229156	87.70	19733	3917
	㉔	LUBE OIL		64	1048.32	67092	92.12	5896	24
F.W.	㉕	DISTILLED P		461	1003.75	462729	86.29	39780	6367
	㉖	POTABLE S		162	1003.75	162608	86.29	13979	280
S.W.B.	㉗	FOREPEAK		16815	49.79	837219	50.23	844617	234179
	㉘	CTR NO. 4		30533	438.33	13383550	49.30	1505277	164078
	㉙	S.W. BALLAST WG P		3640	1048.60	3816904	75.43	274565	——
	㉚	S.W. BALLAST WG S		3212	1052.62	3381015	77.51	248962	——
	㉛	DOUBLE BOTTOM			1026.43		6.41		
	㉜	AFTER PEAK			1122.09		67.28		
	㉝	CREW & STORES		50	1011.00	50550	128.46	6423	——
	㉞	LIGHT SHIP		58840	604.53	35570545	66.50	3912860	——
	㉟	TOTALS [SUM ①-㉞]		249424	541.44	135048606	54.87	13685454	1155709

CONDITION: NO. 11
HEAVY CLEANED BALLAST WITH SLOPS
50% F.O.

DRAFT & TRIM CALCULATIONS:

㊱	DISPLACEMENT	[LINE ㉟, COL.(B)]	249424	TONS
㊲	TONS PER INCH IMMERSION	[FROM P. 22]	516.20	
㊳	L.C.G. AFT F.P.	[LINE ㉟,(D)÷(B)]	541.44	FT
㊴	L.C.B. AFT F.P.	[FROM P. 22]	536.49	FT
㊵	TRIM LEVER	[㊳-㊴, -FWD/+AFT]	4.95	FT
㊶	MOMENT TO TRIM 1"	[FROM P. 22]	35720	FT-TONS
㊷	TRIM	[㊱×㊵÷(12×㊶), -FWD/+AFT]	2.88	FT
㊸	L.C.F. AFT F.P.	[FROM P.22]	545.35	FT
㊹	KEEL DRAFT AT L.C.F., S.W.	[FROM P.22]	43.00	FT
㊺	TRIM APPLIED FWD	[㊷×㊸÷1143]	1.37	FT
㊻	KEEL DRAFT FWD, S.W.	[㊹-㊺]	41.63	FT
㊼	KEEL DRAFT AFT, S.W.	[㊻+㊷]	44.51	FT
㊽	MEAN KEEL DRAFT, S.W.	[(㊻+㊼)÷2]	43.07	FT
㊾	IF ㊽ < 65 FT, IS -10 FT ≤ ㊷ ≤ +20 FT? IF ㊽ ≥ 65 FT, IS -10 FT ≤ ㊷ ≤ +10 FT?	☒ YES ☐ NO SEE NOTE 1		

NOTE 1: IF LINE ㊾ IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO REDUCE TRIM.

STABILITY CALCULATIONS:

㊿	TRANS. MET. ABV B.L.	[FROM P. 22]	117.60	FT
(51)	V.C.G. ABV B.L.	[LINE ㉟,(F)÷(B)]	54.87	FT
(52)	GM UNCORR. FOR FREE SURF.	[㊿-(51)]	62.73	FT
(53)	FREE SURF. CORR.	[LINE ㉟,(G)÷(B)]	4.63	FT
(54)	AVAILABLE GM	[(52)-(53)]	58.10	FT
(55)	REQUIRED GM	[FROM P. 20]	18.00	FT
(56)	IS (54) ≥ (55)? ☒ YES ☐ NO (SEE NOTE 2)			

NOTE 2: IF LINE (56) IS ANSWERED "NO", CARGO OR BALLAST MUST BE REARRANGED TO INCREASE AVAILABLE GM.

LOADING TABLE AND TRIM & STABILITY CALC'S

APPENDIX

STABILITY AFTER FLOODING DUE TO DAMAGE

1. THE FOLLOWING INFORMATION IS PROVIDED FOR GUIDANCE IN ASSESSING THE VESSEL'S STABILITY AFTER FREE FLOODING OF VARIOUS COMBINATIONS OF COMPARTMENTS AND IS NOT RELATED TO DAMAGE STABILITY REQUIREMENTS OF THE UNITED STATES COAST GUARD.

2. ALL FLOODED COMPARTMENTS ARE ASSUMED TO BE OPEN TO THE SEA THROUGH DAMAGE TO THE HULL, PIPING, ETC., AND FLOODED TO THE LEVEL OF THE WATERPLANE.

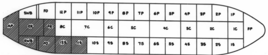
3. ALL FLOODED TANKS ARE ASSUMED TO HAVE BEEN INITIALLY EMPTY TO SIMULATE WORST-CASE CONDITIONS.

4. A CONSERVATIVE VALUE FOR THE VESSEL'S VERTICAL CENTER OF GRAVITY (VCG) IS ASSUMED IN ORDER TO SIMULATE WORST-CASE CONDITIONS.

STABILITY AFTER FLOODING DUE TO DAMAGE

FULL LOAD CONDITION
MEAN DRAFT BEFORE FLOODING = 75.0 FT.
TRIM BEFORE FLOODING = 0
VCG (INCLUDING FREE SURFACE EFFECT) ASSUMED 62.63 FEET ABOVE BASELINE

FLOODED COMPARTMENTS	EQUILIBRIUM CONDITION			RANGE OF STABILITY (DEGREES)	HEEL ANGLE FOR MAXIMUM RIGHTING ARM (DEGREES)	MAXIMUM RIGHTING ARM (FEET)
	MEAN DRAFT (FEET)	TRIM +AFT, -FWD (FEET)	HEEL TOWARDS DAMAGE (DEGREES)			
ENGINE ROOM	76.8	10.9	0.	54	18.5	7.6
PRECEDING PLUS PUMP ROOM	77.6	15.0	0.	53	18.0	7.3
ALL PRECEDING PLUS STBD F.O. STORAGE TK.	78.7	20.6	1.6	45	17.0	5.4
ALL PRECEDING PLUS AFT SWB TK & AFT PEAK	79.7	27.1	2.3	39	16.5	4.3
ALL PRECEDING PLUS WING TK 12S	83.3	43.0	7.3	19	15.5	1.1
ALL PRECEDING PLUS WING TK 11S	VESSEL FOUNDERS					



NOTE: SHADED COMPARTMENTS INDICATE EXTENT OF FLOODING WHICH RESULTS IN FOUNDERING.

0100-1303

MICRO-MASTER® 105 mm
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ALEXANDRIA • RICHMOND • NORFOLK
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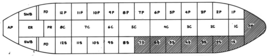
SEPT. '80
8X
FRAME

STABILITY AFTER FLOODING DUE TO DAMAGE

BALLAST CONDITION, FLOODING FWD
MEAN DRAFT BEFORE FLOODING = 40.0 FT.
TRIM BEFORE FLOODING = 0
VCG (INCLUDING FREE SURFACE EFFECT) ASSUMED 69.62 FEET ABOVE BASELINE

FLOODED COMPARTMENTS	EQUILIBRIUM CONDITION			RANGE OF STABILITY (DEGREES)	HEEL ANGLE FOR MAXIMUM RIGHTING ARM (DEGREES)	MAXIMUM RIGHTING ARM (FEET)
	MEAN DRAFT (FEET)	TRIM +AFT, −FWD (FEET)	HEEL TOWARDS DAMAGE (DEGREES)			
FOREPEAK	40.9	− 8.5	0.	67	32.0	26.1
PRECEDING PLUS WING TK 1S	41.5	−12.8	1.0	66	32.0	24.4
ALL PRECEDING PLUS WING TK 2S	42.6	−20.3	3.4	61	31.5	20.8
ALL PRECEDING PLUS WING TK 3S	44.2	−30.2	7.1	56	32.0	16.4
ALL PRECEDING PLUS WING TK 4S	46.4	−41.8	11.8	48	32.5	11.8
ALL PRECEDING PLUS WING TK 5S	49.2	−55.0	17.3	37	34.0	7.2
ALL PRECEDING PLUS WING TK 6S	52.9	−70.8	24.0	23	34.5	2.7
ALL PRECEDING PLUS WING TK 7S	VESSEL FOUNDERS					

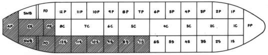


NOTE: SHADED COMPARTMENTS INDICATE EXTENT OF FLOODING WHICH RESULTS IN FOUNDERING.

STABILITY AFTER FLOODING DUE TO DAMAGE

BALLAST CONDITION, FLOODING AFT
MEAN DRAFT BEFORE FLOODING = 40.0 FT.
TRIM BEFORE FLOODING = 15.0 FT. BY STERN
VCG (INCLUDING FREE SURFACE EFFECT) ASSUMED 69.62 FEET ABOVE BASELINE

FLOODED COMPARTMENTS	EQUILIBRIUM CONDITION			RANGE OF STABILITY (DEGREES)	HEEL ANGLE FOR MAXIMUM RIGHTING ARM (DEGREES)	MAXIMUM RIGHTING ARM (FEET)
	MEAN DRAFT (FEET)	TRIM +AFT, −FWD (FEET)	HEEL TOWARDS DAMAGE (DEGREES)			
ENGINE ROOM	41.2	22.6	0.	66	32.0	26.7
PRECEDING PLUS PUMP ROOM	42.1	27.8	0.	67	32.0	27.2
ALL PRECEDING PLUS STBD F.O. STORAGE TK.	42.7	31.1	0.8	65	31.5	25.5
ALL PRECEDING PLUS AFT SWB TK & AFT PEAK	42.8	32.1	0.9	64	31.0	24.6
ALL PRECEDING PLUS WING TK 12S	44.4	39.6	3.3	61	31.5	21.3
ALL PRECEDING PLUS WING TK 11S	46.6	49.5	7.0	56	32.0	17.0
ALL PRECEDING PLUS WING TK 10S	49.2	59.5	11.9	49	32.5	12.5
ALL PRECEDING PLUS WING TK 9S	52.2	68.8	16.4	40	33.5	7.8
ALL PRECEDING PLUS WING TK 8S	56.1	81.0	22.7	26	34.5	3.4
ALL PRECEDING PLUS WING TK 7S	VESSEL FOUNDERS					



NOTE: SHADED COMPARTMENTS INDICATE EXTENT OF FLOODING WHICH RESULTS IN FOUNDERING.

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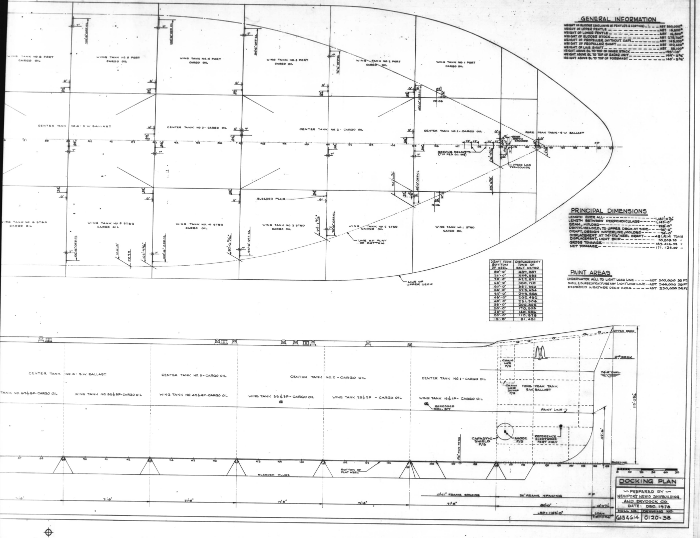

WING TANK NO. 6 PORT CARGO OIL
WING TANK NO. 5 PORT CARGO OIL
WING TANK NO. 4 PORT CARGO OIL
WING TANK NO. 3 PORT CARGO OIL
WING TANK NO. 2 PORT CARGO OIL
WING TANK NO. 1 PORT CARGO OIL
CENTER TANK NO. 4 - S.W. BALLAST
CENTER TANK NO. 3 - CARGO OIL
CENTER TANK NO. 2 - CARGO OIL
CENTER TANK NO. 1 - CARGO OIL
FORE PEAK TANK - S.W. BALLAST
DOCKING BRACKETS (TYP FRS 58-109)
SPEED LOG TRANSDUCER
BLEEDER PLUG
WING TANK NO. 6 STBD CARGO OIL
WING TANK NO. 5 STBD CARGO OIL
WING TANK NO. 4 STBD CARGO OIL
WING TANK NO. 3 STBD CARGO OIL
WING TANK NO. 2 STBD CARGO OIL
WING TANK NO. 1 STBD CARGO OIL
LINE OF FLAT OF BOTTOM
LINE OF UPPER DECK
UPPER DECK
2ND DECK
74'-0" DWL
CHAIN LKR P/S
FORE PEAK TANK S.W. BALLAST
CENTER TANK NO. 4 - S.W. BALLAST
CENTER TANK NO. 3 - CARGO OIL
CENTER TANK NO. 2 - CARGO OIL
CENTER TANK NO. 1 - CARGO OIL
WING TANK NO. 6 S&P - CARGO OIL
WING TANK NO. 5 S&P - CARGO OIL
WING TANK NO. 4 S&P - CARGO OIL
WING TANK 3 S&P - CARGO OIL
WING TANK 2 S&P - CARGO OIL
WING TANK 1 S&P - CARGO OIL
RECESSED SHELL BITT
PAINT LINE
CAPACITIVE SHIELD P/S
ANODE P/S
REFERENCE ELECTRODE PORT ONLY
BASELINE
BOTTOM OF FLAT KEEL
BLEEDER PLUGS
71'-8"
17'-11" FRAME SPACING
24" FRAME SPACING
LBP = 1145'-0"
LOA = 1187'-11 5/16"
0 10 20 30 40 50

GENERAL INFORMATION

WEIGHT OF RUDDER (EXCLUSIVE OF PENTLES & COATING) — ABT 560,000#
WEIGHT OF UPPER PENTLE — ABT 16,800#
WEIGHT OF LOWER PENTLE — ABT 16,800#
WEIGHT OF RUDDER STOCK — ABT 275,760#
WEIGHT OF PROPELLER (WITHOUT CAP) — ABT 145,000#
WEIGHT OF PROPELLER SHAFT — ABT 100,400#
WEIGHT OF LINE SHAFT — ABT 56,100#
HEIGHT ABOVE BL TO TOP OF INNER STACK — 195'-10"
HEIGHT ABOVE BL TO TOP OF RADAR UNIT — 199'-6 3/4"
HEIGHT ABOVE BL TO TOP OF FOREMAST — 140'-5 3/4"

PRINCIPAL DIMENSIONS

LENGTH OVER ALL — 1,187'-11 5/16"
LENGTH BETWEEN PERPENDICULARS — 1,145'-0"
BEAM, MOLDED — 228'-0"
DEPTH, MOLDED, TO UPPER DECK AT SIDE — 95'-0"
DRAFT, DESIGN WATERLINE, MOLDED — 74'-0"
DISPLACEMENT AT 74'-1 1/16" KEEL DRAFT — 451,914 TONS
DISPLACEMENT, LIGHT SHIP — 58,839.78 "
GROSS TONNAGE — 189,416.92 "
NET TONNAGE — 171,125.00 "

DRAFT FROM BOTTOM OF KEEL	DISPLACEMENT TONS OF SALT WATER
80'-0"	489,887
74'-0"	449,553
70'-0"	422,891
65'-0"	380,120
60'-0"	357,350
55'-0"	325,454
50'-0"	293,558
45'-0"	262,432
40'-0"	231,306
35'-0"	200,805
30'-0"	170,305
25'-0"	140,556
20'-0"	110,628
15'-0"	81,451

PAINT AREAS

UNDERWATER HULL TO LIGHT LOAD LINE — ABT. 300,000 SQ FT
SHELL & SUPERSTRUCTURE ABV LIGHT LOAD LINE — ABT. 544,000 SQ FT
EXPOSED WEATHER DECK AREA — ABT. 250,000 SQ FT

DOCKING PLAN

— PREPARED BY —
NEWPORT NEWS SHIPBUILDING
AND DRYDOCK CO.
DATE: DEC. 1978

HULL NO.	DRAWING NO.
613&614	0120-38

1

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH	OWNER DATE	OWNER APP
A	1.	INITIAL ISSUE				
B	1.	INDICATION OF CATHODIC PROTECTION SYSTEM FWD OF FR 109 ADDED IN PROFILE VIEW TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 1800-72.				
	2.	HEIGHT OF SHELL PAINT LINE REVISED IN PROFILE VIEW TO SUIT OWNERS REQUEST ON 9-2-77 AND AS INDICATED ON DWG NO. 8300-40. TABLE OF PAINT AREAS REVISED TO SUIT.				
	3.	SHORE POWER CONNECTION RELOCATED FROM FR 44 NEAR CL TO FR 38 AT 13'-6" OFF CL PORT TO SUIT DESIGN DEVELOPMENT AS REQUESTED BY OUR ELECTRICAL GROUP ON 9-28-77.				
	4.	LOCATION OF DOCKING BRACKETS FRS 58-109 IN WAY OF CVK REVISED TO SUIT DEVELOPEMENT AS INDICATED ON DWG NO. 1030-528.				
	5.	BLEEDER PLUG ADDED 3' AFT OF FR 29 AND 5' OFF CL PORT TO FACILITATE DRAINAGE.				
	6.	BLEEDER PLUG 8' AFT OF FR 38 & 33'-5' ABOVE BL DELETED TO AGREE WITH DWG NO. 2500-2288.				
	7.	BLEEDER PLUG ADDED 8' AFT OF FR 47 STBD & 8' AFT OF FR 50 PORT ABOUT 32'-0" ABOVE BL TO FACILITATE DRAINAGE OF THE SALT WATER WING BALLAST TANKS.	JBC	[illegible]	JW	LET NO 2012V OF 9-14-78
C	1.	SPEED LOG TRANSDUCER ADDED FRS 112-113 ABOUT 15' OFF CL STBD TO SUIT DESIGN DEVELOPMENT AS INDICATED ON DWG NO. 4500-2651.	JBC			

AUTHORITY:

GENERAL NOTES:

NO.	REFERENCES	DWG NO.
14	CVK FRS 58-109	1030-528
13	ARRGT SEA CHEST IN CARGO PUMP ROOM	6000-314
12	ARRGT DISCHARGE SEA CONNECTIONS IN ENGINE ROOM	6000-320
11	MAIN CONDENSER INJECTION SCOOP ARRGT & DET	6000-326
10	ARRGT OF SUCTION SEA CHESTS IN ENGINE ROOM	6000-317
9	MAIN CONDENSER DISCHARGE SEA CONN. ARRGT & DET	6000-329
8	CATHODIC PROTECTION SYSTEM	1800-72
7	PAINTING SCHEDULE	8300-40
6	PROPELLER FIT-UP & INSTALLATION PROCEDURE	6309-92
5	SHAFTING ARRANGEMENT	6301-218
4	LIFTING GEAR ARRGT & DETAILS SHAFT REMOVAL	6340-272
3	SHIPS NAME, HAILING PORT, & DRAFT MARKS LOCATIONS	1800-76
2	RUDDER ELEVATIONS	1310-70
1	BLEEDER PLUGS	2500-2288

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS

OWNERS LETTER NO. 1779V OF 8-26-77
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPT.
FSCM NO. 43689

SCALE 1/16" & AS NOTED = 1 FT
DRAWN E. PARKMAN & J.D. BENTON
CHECKED J. B. CORUM JR.
SECT MGR JW Hays 7-12-77
TECH APPROVAL
DATE COMPL. 7-12-77
EXAMINED ~
AUTHORIZED A. Conley
DATE 7-13-77
C S D APPROVAL R. L. Harrington

DOCKING PLAN

U S M A DESIGN T11-S-119a
~~U S M A DWG NO.~~
HULL NO. 309 & 310
DWG NO. 0120-38
REV C
SHEET NO. 1 OF 1

1

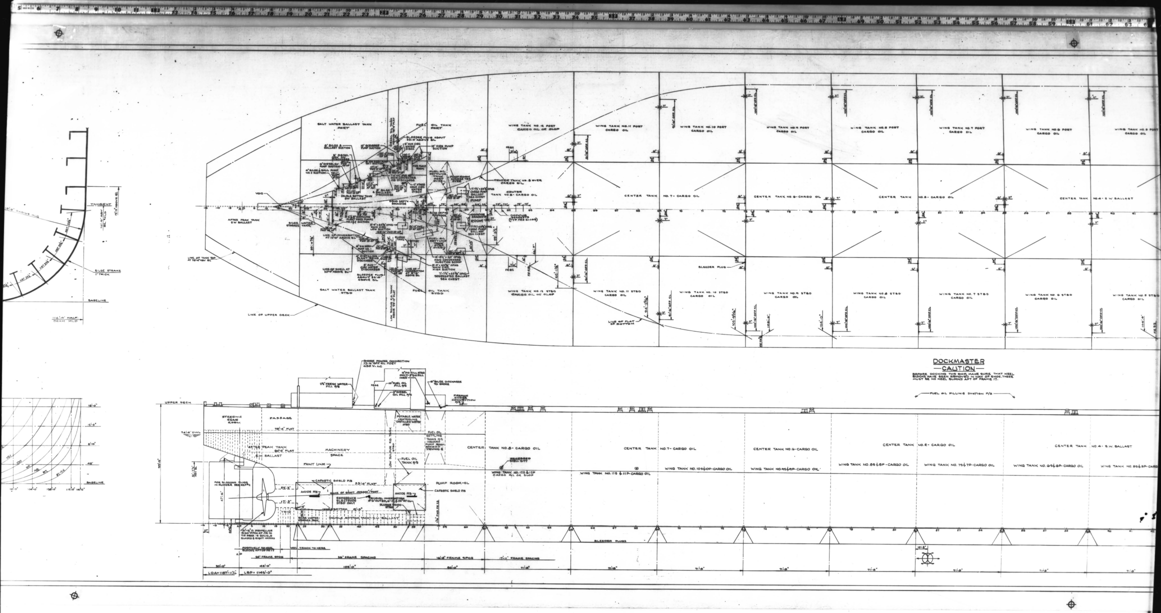
REPRODUCTION OFFICE
YARD PRINTS Yes GROUPING No
REMARKS BLUELINE PRINTS FROM AN AUTO-POSITIVE
— SEE BELOW —
CHARGE TO 613C-10079
DATE 5-11-78 SIGNED J.W. Hays

YARD PRINTS
ORDERED BY DESIGN
GROUP: MC NO.

D
C
B
A

0120-38

SEPT. '80
10X
FRAME 1


SALT WATER BALLAST TANK PORT
FUEL OIL TANK PORT
WING TANK NO. 12 PORT CARGO OIL OR SLOP
WING TANK NO. 11 PORT CARGO OIL
WING TANK NO. 10 PORT CARGO OIL
WING TANK NO. 9 PORT CARGO OIL
WING TANK NO. 8 PORT CARGO OIL
WING TANK NO. 7 PORT CARGO OIL
WING TANK NO. 6 PORT CARGO OIL
WING TANK NO. 5 PORT CARGO OIL
CENTER TANK NO. 8 - CARGO OIL
CENTER TANK NO. 7 - CARGO OIL
CENTER TANK NO. 6 - CARGO OIL
CENTER TANK NO. 5 - CARGO OIL
CENTER TANK NO. 4 - S.W. BALLAST
AFTER PEAK TANK S.W. BALLAST
VOID
PUMP ROOM
ECHO DEPTH SOUNDER
BLEEDER PLUG
SALT WATER BALLAST TANK STBD
FUEL OIL TANK STBD
WING TANK NO. 12 STBD CARGO OIL OR SLOP
WING TANK NO. 11 STBD CARGO OIL
WING TANK NO. 10 STBD CARGO OIL
WING TANK NO. 9 STBD CARGO OIL
WING TANK NO. 8 STBD CARGO OIL
WING TANK NO. 7 STBD CARGO OIL
WING TANK NO. 6 STBD CARGO OIL
WING TANK NO. 5 STBD CARGO OIL
LINE OF UPPER DECK
LINE OF FLAT OF BOTTOM
TANGENT
BILGE STRAKE 1" THICK
BASELINE
114'-0" HALF BEAM MLD
DOCKMASTER
CAUTION
BEFORE DOCKING THIS SHIP, MAKE SURE THAT KEEL BLOCKS HAVE BEEN REMOVED IN WAY OF SHOE. THERE MUST BE NO KEEL BLOCKS AFT OF FRAME 17.
FUEL OIL FILLING STATION P/S
SHORE POWER CONNECTION
FIREMAIN SHORE CONNECTION
UPPER DECK
STEERING GEAR ROOM
PASSAGE
AFTER PEAK TANK S.W. BALLAST
MACHINERY SPACE
PAINT LINE
FUEL OIL TANK P/S
PUMP ROOM - CL
CAPASTIC SHIELD P/S
ANODE P/S
INNER BOTTOM
VOID
WING TANK NO. 12S & 12P CARGO OIL OR SLOP
WING TANK NO. 11S & 11P - CARGO OIL
WING TANK NO. 10S & 10P - CARGO OIL
WING TANK NO. 9S & 9P - CARGO OIL
WING TANK NO. 8S & 8P - CARGO OIL
WING TANK NO. 7S & 7P - CARGO OIL
WING TANK NO. 6S & 6P - CARGO OIL
WING TANK NO. 5S & 5P - CARGO OIL
BLEEDER PLUGS
LOA = 1187'-11½"
LBP = 1143'-0"
71'-8"

0120-38

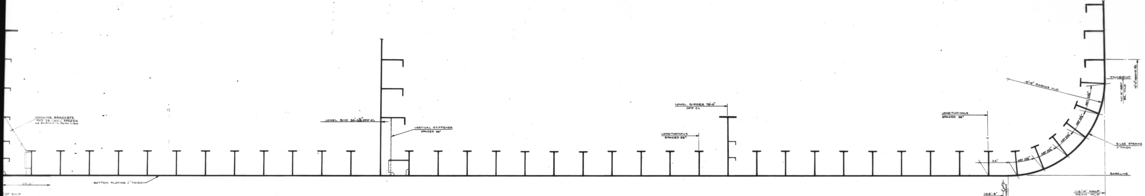
MICRO-MASTER 105 mm

K+E

SEPT. '80

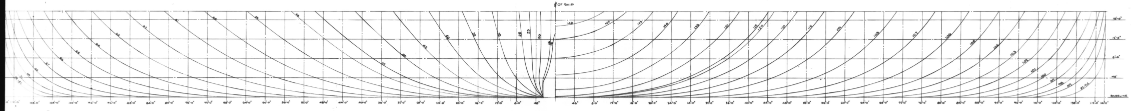
10X

FRAME 2


DOCKING BRACKETS
FNS 58-189 — SPACED
AS SHOWN IN PLAN VIEW
LONGL. BHD 30'-0⅜" OFF CL
VERTICAL STIFFENER
SPACED 30"
BOTTOM PLATING 1" THICK
28'-2"
℄ OF SHIP
LONGITUDINALS
SPACED 36"
LONGL. GIRDER 75'-0"
OFF CL
LONGITUDINALS
SPACED 36"
10'-0" RADIUS MLD
TANGENT
10'-0" ABV
BL MLD
15'-0" ABOVE BL
34"
ABT 33½"
ABT 33½"
ABT 33½"
ABT 33½"
ABT 33½"
ABT 33½"
BILGE STRAKE
1" THICK
BASELINE
103'-6"
TANGENT
104'-0" OFF
CL MLD
114'-0" HALF-
BEAM MLD

MIDSHIP SECTION

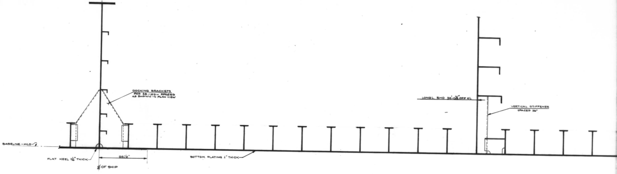
1/2" = 1'-0"


℄ OF SHIP
18'-0"
12'-0"
6'-0"
48"
BASELINE
48"
8'-0"
12'-0"
16'-0"
20'-0"
24'-0"
28'-0"
32'-0"
36'-0"
40'-0"
44'-0"
48'-0"
52'-0"
56'-0"
60'-0"
64'-0"
68'-0"
72'-0"
76'-0"
80'-0"
84'-0"
88'-0"
92'-0"
96'-0"
100'-0"
104'-0"
108'-0"
112'-0"
116'-0"

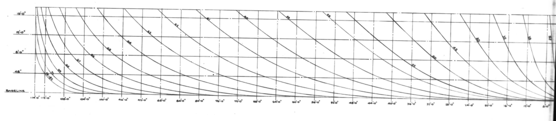
BODY PLAN

1/4" = 1'-0"

0120-38
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 3
10X


DOCKING BRACKETS
PCS 38-109-4 SPACED
AS SHOWN IN PLAN VIEW
BASELINE - MLD
FLAT KEEL 1¼" THICK
58½"
℄ OF SHIP
BOTTOM PLATING 1" THICK
LONGL. BHD 38'-0⅜" OFF CL
VERTICAL STIFFENER
SPACED 30"

MI

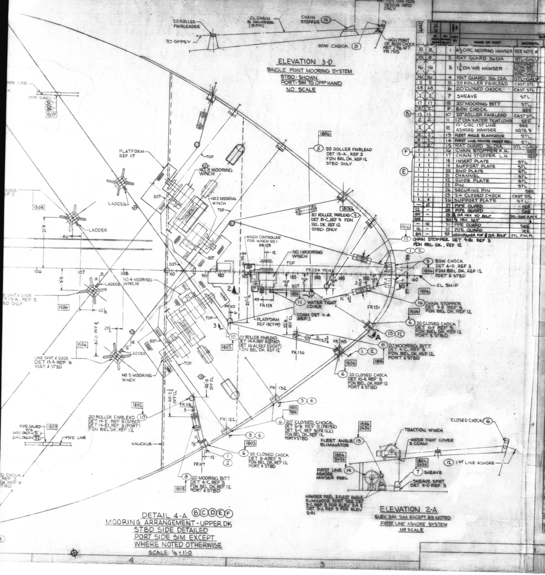

16'-0"
12'-0"
8'-0"
4'-0"
BASELINE
116'-0"
112'-0"
108'-0"
104'-0"
100'-0"
96'-0"
92'-0"
88'-0"
84'-0"
80'-0"
76'-0"
72'-0"
68'-0"
64'-0"
60'-0"
56'-0"
52'-0"
48'-0"
44'-0"
40'-0"
36'-0"
32'-0"
28'-0"
24'-0"
20'-0"
16'-0"
12'-0"
8'-0"
72-82
71
70
69
68
67
66
65
64
63
62
61
60
59
58
55
50
45
40
35
30
25

0120-38

SEPT. '80

FRAME 4

10X



ELEVATION 3-D
SINGLE POINT MOORING SYSTEM
STBD - SHOWN
PORT - SIM TO OPP HAND
NO SCALE
20 ROLLER FAIRLEADER
CL CHAIN & HAWSER (SPM)
CHAIN STOPPER 16
TO GYPSY
BOW CHOCK 9
THIS DIM FOR DESIGN INFO ONLY
HIGH POINT OF BOW CHOCK ABT 2 5/8 AFT FR 155
PIPE LINE
PIPE GUARD
1507
PLATFORM REF 17
NO. 3 MOORING WINCH
NO. 2 MOORING WINCH
NO. 1 MOORING WINCH
NO. 4 MOORING WINCH
NO. 5 MOORING WINCH
LADDER
TOP
BOT
1506
1805
1806
5 20 ROLLER FAIRLEAD DET 15-A, REF 3 FDN BEL DK, REF 12 STBD ONLY
20 ROLLER FAIRLEAD DET 15-C, REF 3 FDN BEL DK, REF 12 STBD ONLY
WINCH CONTROLLER FOR WINCH NO. 1 FR 129
17 CHAIN STOPPER DET 9-B1 REF 3 FDN BEL DK., REF 12
9 BOW CHOCK DET 4-D, REF 3 FDN BEL DK, REF 12 PORT & STBD
CL SHIP
16 CHAIN STOPPER DET 9-B REF 3 FDN BEL DK, REF 12
11 WATER TIGHT COVER
COAM DET 4-A REF 3
PLATFORM REF 18 (TYP)
6 20 CLOSED CHOCK DET 10-F REF 3 FDN BEL DK, REF 12 PORT & STBD
8 20 MOORING BITT DET 4-C, REF 3 FDN BEL DK, REF 12 PORT & STBD
6 20 CLOSED CHOCK DET 10-E REF 3 FDN BEL DK, REF 12 PORT & STBD
20 ROLLER FAIRLEAD DET 14-A, REF 3 (STBD) DET 14-A1, REF 3 (PORT) FDN BEL DK REF 12
LINE SPRT & GUIDE DET 13-A REF 3 PORT & STBD
10 20 ROLLER FAIRLEAD DET 14-E, REF 3 (STBD) DET 14-E1, REF 3 (PORT) FDN BEL DK, REF 12
6 20" CLOSED CHOCK DET 5-B REF 3, (FR 132) DET 5-C, REF 3 (FR 122) FDN BEL DK, REF 12 PORT & STBD
6 20 CLOSED CHOCK DET 5-A REF 3 FDN BEL DK, REF 12 PORT & STBD
8 20 MOORING BITT DET 4-C, REF 3 FDN BEL DK, REF 12 PORT & STBD
PIPE GAURD P/S 613 ONLY 31 614 ONLY 32
PIPE LINE
KNUCKLE
FR 106 107 108 110 115 117 120 122 129 132 136 139 142 145 151
FR 160
TRACTION WINCH
WATER TIGHT COVER
CLOSED CHOCK 6
FLEET ANGLE ELIMINATOR 13
12 1ST LINE ASHORE
7 SHEAVE
FIRST LINE ASHORE HAWSER REEL 14
SHEAVE SPRT DET 3-D REF 3
1806 0404
HAWSER REEL & FLEET ANGLE ELIMINATOR SPRT SEE DET 3-C REF 3 FOR ELEV 2-A DET 3-A REF 3 FOR ELEV 2-A1

DETAIL 4-A Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ

MOORING ARRANGEMENT - UPPER DK
STBD SIDE DETAILED
PORT SIDE SIM EXCEPT
WHERE NOTED OTHERWISE
SCALE: 1/8 = 1'-0

ELEVATION 2-A
ELEV 2-A1 SIM EXCEPT AS NOTED
FIRST LINE ASHORE SYSTEM
NO SCALE

LIST OF MATERIAL

QUANTITIES ARE FOR ONE SHIP OR ONE ASSEMBLY

614 NO PARTS REQ'D	613C NO SPARES REQ'D	ASSY NO	PART NO	NAME OF PART	MATERIAL	MAT'L SPECS	ZONE	REFERENCE PLAN NO	SHOCK GRADE	UNIT WT LBS	REMARKS
8	8		1	6 1/2 CIRC MOORING HAWSER	SEE NOTE 9	COML		ORD. ON REF. 16			L=1017' BS=124,000 MIN, WHITE, SEE NOTE 3
8	8		2	RAT GUARD 36 DIA	STL-GALV	COML					SEE NOTE 6
16	16		3	1 3/4 DIA W.R. HAWSER	PREFORMED EXTRA IMP PLOW STL IWRC-GALV	COML					L=920' BS=262,800# MIN. 6X37 SEE NOTES 2 & 4
16	16		4	RAT GUARD 36 DIA	STL-GALV	COML					SEE NOTE 6
2	2		5	20 ROLLER FAIRLEAD	CAST STL	ASTM 27 GR 60-30					A.C. HOYLE DWG X-114 SIZE 20 SEE NOTE 8
48	48		6	20" CLOSED CHOCK	CAST STL						A.C. HOYLE DWG K101-A, MODEL NO. K-101A-A20
2	2		7	SHEAVE	STL	COML		ORD ON REF 6			
17	17		8	20" MOORING BITT	STL	C-1020					
2	2		9	BOW CHOCK	SEE	REF 8		ORD ON REF 8			A.C. HOYLE DWG K109-A, MODEL NO. K-109A-A20
15	15		10	20" ROLLER FAIRLEAD	CAST STL	ASTM 27 GR 60-30					A.C. HOYLE DWG X-114 SIZE 20A, SEE NOTE 8
2	2		11	12" DIA WATER TIGHT COVER	SEE	DET DWG					SEE NOTE 10
2	2		12	10" CIRC 1ST LINE ASHORE HAWSER	SEE NOTE 9	COML		ORD ON REF 16			L=1520', BS=280,000# MIN, WHITE - SEE NOTE 11
2	2		13	FLEET ANGLE ELIMINATOR	STL	COML		ORD ON REF 6			
2	2		14	FIRST LINE ASHORE HAWSER REEL	STL	COML		ORD ON REF 6			
2	2		15	RAT GUARD 36 DIA	STL-GALV	COML		ORD ON REF 16			SEE NOTE 6
1	1		16	CHAIN STOPPER R.H.	SEE	DET DWG					LEBUS INTERNATIONAL #16-004-001 SEE NOTE 7
1	1		17	CHAIN STOPPER L.H.	SEE	DET DWG					LEBUS INTERNATIONAL #16-004-002 SEE NOTE 7
1	1		18	INSERT PLATE	STL	SEE NOTE 12					
1	1		19	SUPPORT PLATE	STL	SEE NOTE 12					
1	1		20	END PLATE	STL	ABS HULL					
1	1		21	CHANNEL	STL	ABS HULL					
1	1		22	GUIDE PLATE	STL	ABS HULL					
1	1		23	PIN	STL	MIL-S-23009 HY-130 Y.P. 90/125 K					
1	1		24	SECURING PIN	SEE	DET DWG		ASSY 88 ON REF 19			1 DIA., L=4 1/4, C=12
1	1		25	24 CLOSED CHOCK	CAST STL	ASTM 27 GR 60-30					A.C. HOYLE DWG M-137
1	1		26	SUPPORT PLATE	STL	SEE NOTE 12					
—	12		27	PIPE GUARD	SEE	DET DWG		DET 19-A REF 3			
12	-		28	PIPE GUARD	SEE	DET DWG		DET 18-A REF 3			
64	—		29	5/8 DIA HEX HD BOLT	STL-ZINC PLATE	COML					11 UNC-2A, L=1 1/2
64			30	5/8 HEX NUT							11 UNC-2B
—	4		31	PIPE GUARD	SEE	DET DWG		DET 19-C REF 3			
4	—		32	PIPE GUARD	SEE	DET DWG		DET 18-C REF 3			
64	—		33	LOCKWASHER FOR 5/8 DIA BOLT	STL ZINC PL						

Ⓑ (parts 10) Ⓕ (parts 16–17) Ⓔ (parts 18–26)

REVISIONS

COST CHANGE N.N.	COST CHANGE OWNER	REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHD	OWNER DATE	OWNER APPD
10,72	—	A		INITIAL ISSUE				
—	—	B		DET 4-A - DELETED ROLLER FAIRLEAD AT FR 136 P/S AND RELOCATED BITT FROM 3 1/2 AFT FR 140 & 23'-7 OFF CL TO FR 136 & 25'-6 OFF CL P/S. L/M-PT 10 DECR FROM 17 TO 15. DET 12-D-ITEM 48 & 101-23'-7 OFF CL & 3 1/2 AFT FR 140 ALT TO 25'-6 OFF CL & ITEM 91 & 92 VOIDED. RELOCATED PLATF FROM FR 98 TO FR 103 CL PORT ALL TO SUIT OWNERS COMMENTS THEIR LTR 233 DATED 5-14-76. RELOCATED WINCH #10 & #11 FROM 12'-0 1/8 TO 11'-11 7/16 OFF CL AND WINCH #12 FROM 14'-3 15/16 TO 14'-3 11/16 OFF CL & FROM 11 TO 11 7/16 FWD FR 3. ALL TO SUIT DEVELOPMENT OF REF 15.	HLB L			
—	—	C		DET 4-A - WINCH #13 - RELOC FROM 12 TO 10 1/2 FWD FR 3 & 1ST LINE ASHORE HAWSER SCUTTLE RELOC FROM 23 TO 21 1/2 FWD FR 1. WINCH #12, RELOC FROM 11 7/16 FWD FR 2 TO 10 3/8 FWD FR 2. DET 4-A - CLOSED CHOCKS 20 1/4 FWD FR 63 & 20 3/4 FWD FR 99 RELOC TO 20 1/4 FWD FR 63 & 99 P&S. ALL TO SUIT DEVELOPMENT OF BACKING-UP STRUCT ON REF 9	HLB L			
—	—	D		DET 4-A - CLOSED CHOCK RELOCATED FROM 20 1/4 FWD FR 63 TO 18 1/2 & FDN DET ALT FROM 6-A TO 6-A2. TO SUIT BACKING STRUCTURE. DET 4-A - WINCH CONTROL PLATF ADDED IWO MOORING WINCHES TO SUIT. ADDED REF 18.	HLB L			
85	—	E		IN DET 4-A ADDED TOWING BRACKET, DET 17-A, 10" AFT FR-7 & 24 CLOSED CHOCK, DET 16-A AT FR-15. IN L/M ADDED PT NO. 18 THRU 26. ADDED REF 19, 20 & NOTE 12, IN DET 12-D ADDED NO. 108 & 109. ALL TO SUIT OWNERS REQUEST LTR 76V DATED 2-10-76. THIS REV IS A PART OF N.N. CHANGE 85. IN DET 4-A FOAM MONITOR PLATFORMS RELOCATED. CONTROLLERS FOR WINCHES 2, 3, 4, 5, 6 & 7 RELOCATED FROM BET FR 103 & 104 P TO BET FR 102 & 103 S. CONTROLLERS FOR WINCHES 8 & 9 RELOCATED FROM 12 AFT FR 65 P TO 10'-3 FWD FR 64 P. ADDED REF 20. ALL TO SUIT DESIGN DEVELOPMENT	HLB AH			
—	—	F		IN DET 4-A PIPE GUARDS ADDED IWO MOORING WINCHES P/S FR 105-106, FR 99, FR 67-68 & 63-64. IN L/M PT. 27 THRU 32 ADDED. ACCOMPLISHED ON 613C BY LIAISION MEM #570. ALL TO SUIT DESIGN DEVELOPMENT & OWNERS REQUEST.	JLC HLB			

~~AUTHORITY:~~

GENERAL NOTES:

1. FOR GENERAL NOTES PERTAINING TO HULL STRUCTURE SEE REF 1.
2. WIRE ROPE HAWSERS PT 3 SHALL BE STOWED ON THE DRUMS OF THE MOORING WINCHES.
3. MOORING HAWSERS PT 1 SHALL HAVE A LARGE EYE SPLICE WITH A INSIDE DIMENSION OF 72" IN ONE END AND THE OTHER END WHIPPED.
4. WIRE ROPE HAWSER PT 3 SHALL HAVE A LARGE EYE SPLICE WITH A INSIDE DIMENSION OF 9'-0 IN ONE END AND THE OTHER END WHIPPED.
5. MOORING WINCHES AND WINCH CONTROLS ARE ORDERED ON REF 6.
6. RAT GUARDS PTS 2, 4 & 15 SHALL BE FABRICATED WITH 18 USSG AND BE FUNNEL SHAPED. PT 2 TO BE FOR USE WITH PT 1, AND PT 4 TO BE FOR USE WITH PT 3 & PT 15 FOR USE WITH PT 12.
7. CHAIN STOPPERS SHALL BE DESIGNED FOR A 3 INCH DIA CHAIN WITH A BREAKING STRENGTH OF 970,000#. EACH STOPPER SHALL HAVE A STRAIGHTENING DEVICE TO INSURE A VERTICAL LINK OF CHAIN AT THE PAWL FOR POSITIVE STOPPERING
8. VERTICAL ROLLER FAIRLEADS, PT 5 & 10 SHALL BE BRONZE BUSHED AND FITTED WITH PRESSURE GREASE FITTINGS.
9. SYNTHETIC HAWSERS PT 1 & 12 SHALL BE DOUBLE BRAIDED FIBER LINE. THE INNERCORE SHALL BE POLYPROPYLENE AND THE COVER NYLON. HAWSER SHALL BE SIMILAR TO SAMPSON CORDAGE WORKS 2-IN-1 BRAIDED ROPE (POWER BRAID).
10. PT. 11 SHALL CONSIST OF ASSY 196 ON REF 7 (A=12") LESS PTS 78, 212-215.
11. FIRST LINE ASHORE MOORING HAWSER PT 12 SHALL BE PROVIDED WITH A 10'-0 EYE SPLICED IN ONE END AND THE OTHER END WHIPPED.
12. PLATE PT 19 & PT 26 IN ACCORD WITH ASTM STD SPEC A36-74. MODIFIED AS FOLLOWS: Ⓔ
    - A - KILLED
    - B - NORMALIZED
    - C - CARBON MAX. .21%
    - D - CARBON PLUS 1/6 MANGANESE CONTENT MUST BE ≤ .40%
    - E - MIN MANGANESE CARBON RATIO OF 2.5.
    - F - MATL SUPPLIED SHALL BE SILICONE - KILLED FINE-GRAIN PRACTICE.

DETAIL 2-B

LIST OF FOUNDATION NOTE NOS.

	NO	FDN NOTE NO.	NAME OF PART	DIM. OFF CL	FRAME	PORT OR STBD
1307-08-12111	1	1393027	20 CLOSED CHOCK	114'-0	6'-2 AFT 100	S
-12112	2	1393026			6'-2 AFT 100	P
-12113	3	1393025			20 3/4 FWD 99	S
-12114	4	1393024			20 3/4 FWD 99	P
1207- -12115	5	1293022			31 3/8 AFT 97	S
-12116	6	1293023			31 3/8 AFT 97	P
1307- -12117	7	1393046			9'-6 AFT 101	S
-12118	8	1393047			9'-6 AFT 101	P
1207- -12119	9	1293019			9 FWD 96	S
-12120	10	1293020			9 FWD 96	P
1307- -12121	11	1393022	20" ROLLER FAIRLEAD	88'-9	42 5/8 AFT 100	S
-12122	12	1393023			42 5/8 AFT 100	P
1207- -12123	13	1293101			60 3/4 AFT 97	S
-12124	14	1293102			60 3/4 AFT 97	P
1306- -12125	15	1393029	LINE SPRT & GUIDE	36 3/8	61 AFT 100	P
-12126	16	1393030			20 3/4 FWD 99	P
1206- -12127	17	1293024			44 5/8 AFT 97	P
1806- -12128	18	1893050	BOW CHOCK	39	FWD 155	P
-12129	19	1893055			FWD 155	S
0507- -12130	20	0593044	20 CLOSED CHOCK	114'-0	7'-3 1/2 AFT 69	S
-12131	21	0593045			7'-3 1/2 AFT 69	P
-12132	22	0593035			46 1/8 AFT 68	S
-12133	23	0593034			46 1/8 AFT 68	P
-12134	24	0593033			47 1/8 FWD 67	S
-12135	25	0593032			47 1/8 FWD 67	P
-12136	26	0593031	20" ROLLER FAIRLEAD	88'-9	15 1/2 AFT 68	S
-12137	27	0593030	20" ROLLER FAIRLEAD		15 1/2 AFT 68	P
0506- -12138	28	0593038	LINE SPRT & GUIDE	36 3/8	33 5/8 AFT 68	P
-12139	29	0593036			47 1/8 FWD 67	P
1806- -12140	30	1893053	CHAIN STOPPER	70 1/2	3 5/8 FWD 150	S
0507- -12141	31	0593028	20 MOORING BITT	94'-8	40 1/2 FWD 68	P
-12142	32	0593029			40 1/2 FWD 68	S
1207- -12143	33	1293017			9'-10 AFT 97	S
-12144	34	1293018			9'-10 AFT 97	P
0307- -12145	35	0393026			66 AFT 63	P
-12146	36	0393037			66 AFT 63	S
1307- -12147	37	1393048			13 3/8 FWD 100	P
-12148	38	1393049			13 3/8 FWD 100	S
0307- -12149	39	0393031	20 CLOSED CHOCK	114'-0	6'-2 AFT 64	S
-12150	40	0393033			6'-2 AFT 64	P
-12151	41	0393026			20 3/4 FWD 63	P
-12152	42	0393027			20 3/4 FWD 63	S
0306- -12153	43	0393028	LINE SPRT & GUIDE	36 3/8	6'-2 AFT 64	P
-12154	44	0393029			7 3/4 FWD 63	P
1806- -12155	45	1893054	CHAIN STOPPER	70 1/2	3 5/8 FWD 150	P
0307- -12156	46	0393032	20 CLOSED CHOCK	114'-0	12'-9 AFT 63	S

CONTINUED IN PANEL 12

NO.	REFERENCES	DWG NO.
Ⓔ 20	WALKWAYS & RAMPS ON UPPER DK FR 59-105	3300-221
19	STANDARD SECURING PINS	HN-1072
Ⓓ 18	MOORING WINCH CONTROL PLATF - SHIP INSTALLATION	3300-207
17	RAISED PLATF FOR ANCHOR WINDLASS & MOORING WINCHES	3300-197
16	MISC DECK & NAVIGATION GEAR	8000-85
15	FDN MOORING WINCHES UPPER DK AFT FR 23 1/2	1220-2695
14	FDN MOORING WINCHES UPPER DK FR 23 1/2-110	1220-2694
13	FDN MOORING WINCHES UPPER DK FWD FR 110	1220-2693
12	UPPER DK PL & LONG FWD FR 110	1160-39
11	TRANSOM & FRMG	1030-445
10	UPPER DK PL & LONG AFT FR 23 1/2	1160-40
9	UPPER DK PL & LONG 61 1/4-110 OUTBD 52'-6 OFF CL	1160-44
8	BOW CHOCK	1203-56
7	VENTILATION STANDARDS-HEAVY CONSTRUCTION MERCHANT SHIPS	212739
6	WINCHES - ORDER SHT & FDN BOLTS & LINERS	2015-37
5	ANCHOR HDLG - ARRGT & DET	8100-14
4	UPPER DK PL & LONG 61 1/4-110 INBD 52'-6 OFF CL.	1160-43
3	MOORING INSTALLTION DETAILS	1203-52
2	N.N. WELDING PROCEDURE	CSW-2
1	GEN NOTES PERTAINING TO HULL STRUCTURE	0100-749

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614	310	
613	309	

APPROVALS

OWNERS SHELL OIL CO. LETTER DATED 5-14-76	ABS NA
USPH	USCG NA

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
HULL DESIGN DIV.
FSCM NO. 43689
FITTINGS DEPT.

KEY PLAN

SCALE 1/8" = 1 FT
DRAWN H.L. BROADBELT
CHECKED J.G. LOCHSTAMPFOR
SECT MGR R.W. Billing Jr
DATE COMPL. 4-13-76
EXAMINED
AUTHORIZED E.F. Stephenson
DATE 4-13-76
TECH APPROVAL A. CONLEY 4-15-76
C S D APPROVAL [illegible] for R.L. HARRINGTON

390,000 DWT TANKER
MOORING INSTALLATION ARRANGEMENT

U S M A DESIGN T11-S-116a
U S M A DWG NO.
HULL NO. 309, 310
DWG NO. 1203-51
REV F
SHEET NO. 1 OF 1

1203-51

FABRICATION NOTES
REV. E ADDED 3-23-79

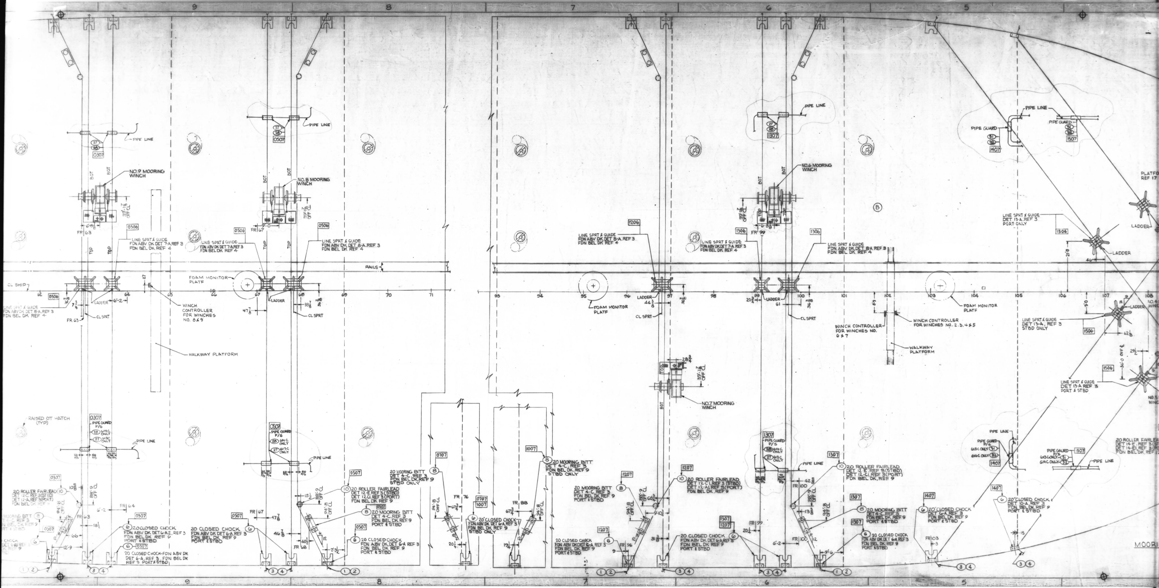
1203-1507-1 MFG GRP FOR PIPE GUARD ON UPP DK FR 106 & 8/5

REV	DWG. REV - HULL APPLIC. 613	614				
A	YES	YES				
B	YES	YES				
C	YES	YES				
D	YES	YES				
E	YES	YES				
F	YES	YES				

PD PRTS 7-9-76

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING YES
REMARKS
FOR GROUPS & ISSUE REV F
DATE 3/16/79 SIGNED R.W. SILLING JR

1203-51
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
FRAME 1
10X


9
8
7
6
5
PIPE LINE
0307
0507
1307
1507
1407
PIPE GUARD
NO.9 MOORING WINCH
NO.8 MOORING WINCH
NO.6 MOORING WINCH
NO.7 MOORING WINCH
BOT
TOP
FR 63
FR 67
FR 99
0306
0506
1206
1306
1506
LINE SPRT & GUIDE FDN ABV DK DET 7-A REF 3 FDN BEL DK REF 4
LINE SPRT & GUIDE FDN ABV DK DET 8-A REF 3 FDN BEL DK REF 4
LINE SPRT & GUIDE DET 13-A REF 3 PORT ONLY
LINE SPRT & GUIDE DET 13-A REF 3 STBD ONLY
LINE SPRT & GUIDE DET 13-A REF 3 PORT & STBD
RAILS
FOAM MONITOR PLATF
CL SHIP
LADDER
CL SPRT
WINCH CONTROLLER FOR WINCHES NO. 8 & 9
WINCH CONTROLLER FOR WINCHES NO. 6 & 7
WINCH CONTROLLER FOR WINCHES NO. 2, 3, 4 & 5
WALKWAY PLATFORM
RAISED OT HATCH (TYP)
PLATFORM REF 17
B
20 ROLLER FAIRLEAD DET 12-E REF 3 (STBD) DET 12-C1 REF 3 (PORT) FDN BEL DK REF 9
20 MOORING BITT DET 4-C REF 3 FDN BEL DK REF 9 PORT & STBD
20 MOORING BITT DET 4-C REF 3 FDN BEL DK REF 9 STBD ONLY
20 CLOSED CHOCK FDN ABV DK DET 6-A REF 3 FDN BEL DK REF 9 PORT & STBD
20 CLOSED CHOCK FDN ABV DK DET 6-A REF 3 FDN BEL DK REF 9 STBD ONLY
20 CLOSED CHOCK DET 6-A REF 3 FDN BEL DK REF 9 PORT & STBD
20 CLOSED CHOCK DET 10-A REF 3 FDN BEL DK REF 9 PORT & STBD
20 ROLLER FAIRLEAD DET 14-E REF 3 (STBD) DET 14-E1 REF 3 (PORT) FDN BEL DK REF 9
0707
1007
1207
FR 64
FR 68
FR 76
FR 88
FR 96
FR 100
FR 103
MOORI

MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 2

10X

1203-51

FABRICATION NOTES

REV. E ADDED 3-23-79

THE NOTES BELOW AND THE ONES MARKED Ⓑ ARE FOR NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY USE FOR FABRICATION AND ERECTION PURPOSES ONLY. THEIR ADDITION TO THIS PLAN IS NOT MADE UNDER THE SUPERVISION OF THE HULL DESIGN DIVISION, THUS, THEY CAN IN NO WAY BE CONSTRUED AS AFFECTING OR MODIFYING THE DESIGN DEPICTED HEREIN OR ANY NON-DEVIATIONAL REQUIREMENTS.

DWG. 1203-51 B,C,D,E,F

1. 050 DIVISION E

   A. FURNISH ALL MATERIAL TO X-12 OR X-11 AS PER DWG. DETAIL.

2. X-12 STEEL PRODUCTION SHOP

   A. ASSEMBLE DIRECTIONAL CHANGE SHEAVE SUPPORT PART 7 WITH FOUNDATION ON DWG. 1203-52 SHEET 3, DETAIL 3D & 3F.
   B. ASSEMBLE W.T. COVER PART 11 WITH COAMING ON DWG. 1203-52 SHEET 4, DETAIL 4A.
   C. ASSEMBLE CLOSED CHOCK PART 6 WITH FOUNDATION ON DWG. 1203-52 SHEET 6, DETAILS 6A, 6B, 6C, 6D, 6E, 6F AND 6G.
   D. ASSEMBLE CHAIN STOPPER PART #16 AND 17 WITH FOUNDATION ON DWG. 1203-52 SHEET 9, DETAILS 9B, 9B1, 9A, 9A1, 9C AND 9D.
   E. ASSEMBLE ROLLER FAIRLEAD PART #10 WITH FOUNDATION ON DWG. 1203-52 SHEET 11, DETAILS 11A & 11B.
   F. ASSEMBLE ROLLER FAIRLEAD PART #10 WITH FOUNDATION ON DWG. 1203-52 SHEET 11, DETAILS 11C & 11D.
   G. ASSEMBLE ROLLER FAIRLEAD PART #10 WITH FOUNDATION ON DWG. 1203-52 SHEET 11, DETAILS 11E & 11F.
   H. ASSEMBLE ROLLER FAIRLEAD PART #10 WITH FOUNDATION ON DWG. 1203-52 SHEET 12, DETAILS 12E & 12F.
   I. ASSEMBLE ROLLER FAIRLEAD PART #10 WITH FOUNDATION ON DWG. 1203-52 SHEET 12, DETAILS 12C, 12C1, 12D AND 12D1.
   J. ASSEMBLE ROLLER FAIRLEAD PART #10 WITH FOUNDATION ON DWG. 1203-52 SHEET 12, DETAILS 12A, 12A1, 12B AND 12B1.
   K. ASSEMBLE ROLLER FAIRLEAD PART #10 WITH FOUNDATION ON DWG. 1203-52 SHEET 14, DETAILS 14A, 14A1, AND 14B.
   L. ASSEMBLE ROLLER FAIRLEAD PART #10 WITH FOUNDATION ON DWG. 1203-52 SHEET 14, DETAILS 14E 14E1 AND 14F.
   M. ASSEMBLE ROLLER FAIRLEAD PART #10 WITH FOUNDATION ON DWG. 1203-52 SHEET 15, DETAILS 15A & 15B.
   N. ASSEMBLE ROLLER FAIRLEAD PART #10 WITH FOUNDATION ON DWG. 1203-52 SHEET 15, DETAILS 15C & 15D.

3. X-11 FINAL ASSEMBLY PLATEN C D E

   A. INSTALL REMAINDER OF MOORING EQUIPMENT WITH ASSEMBLIES AS MARKED IN BODY OF DRAWING.

4. OA F

   A. OA TO FURNISH PIPE GUARDS TO SHIPFITTERS

5 X-11 SHIP F

   A. FIT TO INSTALL PIPE GUARDS IN PLACE ON SHIP

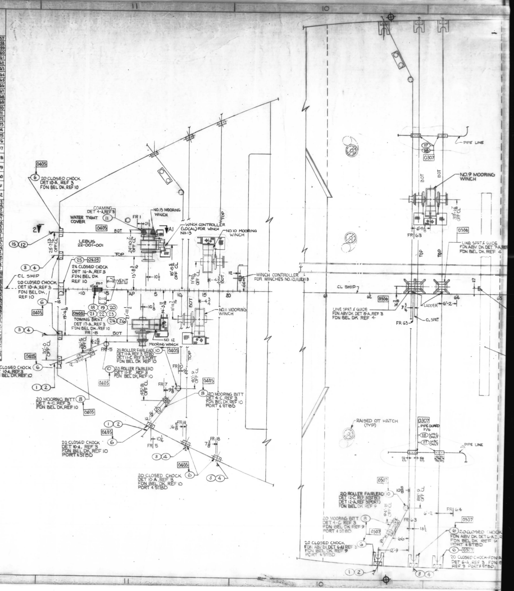
12

CONTINUED FROM PANEL 2

DETAIL 12-D

LIST OF FOUNDATION NOTE NOS.

	NO	FDN NOTE NO.	NAME OF PART	DIM OFF CL	FRAME	PORT OR STBD		
	47	0393034	20 CLOSED CHOCK	114'-0	12'9 AFT 63	P	0307-08-	12157
Ⓑ	48	1893047	20 MOORING BITT	25'-6	136	P	1806-	-12158
	49	0393035	20 ROLLER FAIRLEAD	188'-9	10⅝ AFT 63	S	0307-	-12159
	50	0393036	↓	↓	10⅝ AFT 63	P	↓	-12160
	51	0493117	20 CLOSED CHOCK	23'-7 15/16	TRANSOM	P	0405-	-12161
	52	0493113		30'-0	↓	S	-	-12162
	53	0493105		SIDE SHELL	10¼ AFT 5	S	-	-12163
	54	0493106		↓	↓	P	-	-12164
	55	0493116		13'-8 3/16	TRANSOM	P	-	-12165
	56	0493114		19'-4¼	↓	S	-	-12166
	57	0493118		SIDE SHELL	7⅜ AFT 18	S	-	-12167
	58	0493119			↓	P	-	-12168
	59	0493066			16⅝ FWD 11	P	-	-12169
	60	0493067	↓	↓	↓	S	-	-12170
	61	0493103	20 MOORING BITT	45-8	9⅞ FWD 7	S	-	-12171
	62	0493104	↓	↓	↓	P	-	-12172
	63	0493100	20 ROLLER FAIRLEAD	40'-9	9¼ FWD 10	P	-	-12173
	64	0493074		↓	↓	S	-	-12174
	65	0493107	↓	21'-11½	FR-5	S	-	-12175
	66	0493112	20 MOORING BITT	26'-5	2⅝ AFT-8	S	↓ -	-12176
	67	0493120	ROPE REEL-FIRST LINE ASHORE WINCH-AFT	36'-3	5⅞ FWD-1	P	0404-	-12177
	68	0493121	FLEET ANGLE ELIMINATOR PORT-AFT	ABT 36'-3	ABT 5⅞ FWD-1	P	-	-12178
	69	0493122	DIRECTION CHANGE SHEAVE PORT AFT	24'-10 7/16	23 FWD 1	P	↓ -	-12179
	70	1893056	ROPE REEL-FIRST LINE ASHORE WINCH FWD	8'-3 7/16	17¼ AFT 127	S	1806-	-12180
	71	1893057	FLEET ANGLE ELIMINATOR STBD FWD	8'-4¼	ABT 128	S	-	-12181
	72	1893058	DIRECTION CHANGE SHEAVE STBD FWD	8'-2¾	1 FWD 131	S	↓ -	-12182
	73	1493014	20 CLOSED CHOCK	SIDE SHELL	3 FWD 103	S	1407-	-12183
	74	1493013				P	-	-12184
	75	1493015			15 AFT 105	S	-	-12185
	76	1493016	↓	↓	↓	P	↓ -	-12186
	77	1593025	LINE SPRT & GUIDE	36'-0	29½ AFT 108	P	1506-	-12187
C	78	1593026		↓	↓	S	-	-12188
	79	1593027		9'-0	62⅛ FWD 108	S	-	-12189
	80	1593028	↓	21'-0	46 AFT 107	P	↓ -	-12190
	81	1893038	20 CLOSED CHOCK	SIDE SHELL	12 FWD 117	P	1805-	-12191
	82	1893039			↓	S	↓ -	-12192
	83	1893034			FR 145	S	1806-	-12193
	84	1893035			↓	P	-	-12194
	85	1893051			FR 151	S	-	-12195
	86	1893041	↓	↓	↓	P	↓ -	-12196
	87	1893044	20 ROLLER FAIRLEAD	21'-1⅛	6 FWD 122	S	1805-	-12197
	88	1893045		↓	↓	P	-	-12198
	89	1893042		52'-0	FR 115	S	-	-12199
	90	1893043		↓	↓	P	↓ -	-12200
Ⓑ	~~91~~	~~1893032~~		~~21'-8~~	~~FR 136~~	~~S~~	~~1806-~~	~~-12201~~
	~~92~~	~~1893033~~				~~P~~		~~-12202~~
	93	1893052		7'-6⅜	FR 139	S	-	-12203
	94	1893059	↓	6'-0⅜	FR 142	S	↓ -	-12204
	95	1893048	20 CLOSED CHOCK	SIDE SHELL	FR 122	S	1805-	-12205
	96	1893049			↓	P	↓ -	-12206
	97	1893036			FR 132	S	1806-	-12207
	98	1893037	↓	↓	↓	P	↓ -	-12208
	99	1893040	20 MOORING BITT	40'-2¾	5 FWD 115	P	1805-	-12209
	100	1893030			↓	S	↓ -	-12210
Ⓑ	101	1893046	↓	25'-6	136	S	1806-	-12211
	102	0493124	COAMING	24'-10 7/16	23 FWD 1	P	0405-	-12216
	103	1893060	↓	8'-2 3/16	49 FWD 129	S	1806-	-12217
	104	0793001	20 MOORING BITT	94'-8	67¾ AFT 76	S	0707-	-12214
	105	0793002	20 CLOSED CHOCK	114'-0	20¼ FWD 76	S	0707-	-12215
	106	1093001	20 MOORING BITT	94'-8	63⅞ FWD 88	S	1007-	-12213
	107	1093002	20 CLOSED CHOCK	114'-0	19¼ AFT 88	S	1007-	-12212
Ⓔ	108	0493084	TOWING BRKT	CL	10 AFT-7	CL	0493-	-12689
B	109	0493083	24 CLOSED CHOCK	CL	-15	CL	0493-	-12690


11
10
D
C
A
12
0405
20 CLOSED CHOCK DET 10-A, REF 3 FDN BEL DK, REF 10
COAMING DET 4-A, REF 3
WATER TIGHT COVER
NO.13 MOORING WINCH
WINCH CONTROLLER (LOCAL) FOR WINCH NO.13
NO.10 MOORING WINCH
LEBUS 22-001-001
BOT
TOP
FR 1
24 CLOSED CHOCK DET 16-A, REF 3 FDN BEL DK REF 10
CL SHIP
20 CLOSED CHOCK DET 10-A, REF 3 FDN BEL DK, REF 10
VENT
WINCH CONTROLLER FOR WINCHES NO.10,11,12,13
NO.11 MOORING WINCH
TOWING BRKT DET 17-A, REF 3 FDN BEL DK REF 10
FR-8
NO.12 MOORING WINCH
20 ROLLER FAIRLEAD DET 11-A, REF 3 STBD DET 11-C REF 3 PORT FDN BEL DK REF 10
20 ROLLER FAIRLEAD DET 11-E, REF 3 FDN BEL DK REF 10
20 CLOSED CHOCK DET 10-A, REF 3 FDN BEL DK REF 10
20 MOORING BITT DET 4-C, REF 3 FDN BEL DK, REF 10
20 MOORING BITT DET 4-C, REF 3 FDN BEL DK REF 10 PORT & STBD
20 CLOSED CHOCK DET 10-A, REF 3 FDN BEL DK REF 10 PORT & STBD
FR 5
FR 18
0307
PIPE LINE
NO.9 MOORING WINCH
LINE SPRT & GUIDE FDN ABV DK DET 6-A REF 3 FDN BEL DK REF 4
FR 63
LADDER
CL SPRT
RAISED OT HATCH (TYP)
PIPE GUARD
20 ROLLER FAIRLEAD DET 12-C REF 3 (STBD) DET 12-A REF 3 (PORT) FDN BEL DK REF 9
20 MOORING BITT DET 4-C REF 3 FDN BEL DK REF 9 PORT & STBD
20 CLOSED CHOCK FDN ABV DK DET 6-A REF 3 FDN BEL DK REF 9 PORT & STBD
FR 64
0306

1203-51

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
10X
FRAME 3

ENB VAULT HF35

REPRODUCTION OFFICE

YARD PRINTS YES GROUPING YES

REMARKS

REV. H FOR GROUPS & ISSUE

DATE 3/16/79 SIGNED RW SILLING JR

	FIRST ISSUE	DEPT.	NO. PRTS.	REV.	DATE ISSUED	SPECIAL PRINTS
YARD PRINTS	8-5-76	X10A	1	B	8-5-76	
		BL		C	9-22-76	
	8-5-76	X10	4	D	12-15-76	
		EL		E	3-25-77	
	8-5-76	XII	6	F	1-25-78	
	1-25-78	MI	2	G	5-2-78	
	8-5-76	XIV	4	H	4-2-79	
	2-5-78	MS	2			
	5-2-78	86/c	1			
		PM				
		PS				
		PN				
		RD				
		RM				
		MIR				
		SH				
		SM				
		TM				
		WD				
		WE				
		WM				
		CSD				
	8-5-76	Ro11/SEPIA	1			
	↓	X10A/SEPIA	1			
ORDERED BY DESIGN	9-22-76	CSD IV	1			
		KSO BUL	1			
		RWS	1			
		[illegible]	X			
		USCG				
		BLDG 60	1			
		X10A	X			
		[illegible]	X			
	↓	WTO	1			
	1-26-78	041	X			

GROUP: MC NO. 124

HTD	DH	YD
N	104	124

PD PRTS 7-9-76

GENERAL NOTES

1. FOR GENERAL NOTES PERTAINING TO HULL STRUCTURE SEE REFERENCE 1.
2. ALL MATERIAL AND LABOR FOR FDNS SHALL BE CHARGED TO THE 1220 CLASS.
3. FOR ARRANGEMENT OF MOORING FITTINGS SEE REF 3
4. (B) SLOPE & HEIGHT OF ROLLER FAIRLEADERS SHALL BE SET TO THE SATISFACTION OF OWNERS REPRESENTATIVE PRIOR TO WELDING TO DECK.
5. INACCESSIBLE VOIDS REFERENCING THIS NOTE TO BE PAINTED IN ACCORDANCE WITH REF 4 SH 16 : LINE 33.
6. PART NOS SHOWN ON THIS DWG ARE ORDERED ON REF 3.
7. (G) IN SECTION 17-C- WELDING OF PT 21 TO PT 23 TO BE IN ACCORDANCE WITH WELDING ENGINEERS MEMORANDUM NO. 554 DATED 11-7-77.

AUTHORITY

DWG. REV. — HULL APPLIC.						
REV	NN HULLS ONLY					
	613	614				
A	YES	YES				
B	YES	YES				
C	YES	YES				
D	YES	YES				
E	YES	YES				
F	YES	YES				
G	YES	YES				
H	YES	YES				

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS	
OWNERS SHELL OIL CO LETTER DATED 5-14-76	ABS NA
USPH	USCG NA

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

HULL DESIGN DIV.

FSCM NO. 43689
FITTINGS DEPT.

ISSUE	
PARTIAL	☒
COMPLETE	☐

FABRICATION NOTES
REV H ADDED 3-23-79

SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1-A	1-B	16	17	18	19
REVISION	H	H	E	H	B	D	B	B	B	B	B	B	D	B	C	D	D	F	G	H	H
SHEET																					
REVISION																					
SHEET																					
REVISION																					

K&E 19 1293 3-72 2349+

KEY PLAN

SCALE AS NOTED = 1 FT
DRAWN H.L. BROADBELT
CHECKED J.G. LOCHSTAMPFOR
SECT MGR RW Silling Jr
DATE COMPL. 4-20-76
EXAMINED
AUTHORIZED E.E. STEPHENSON
DATE 4-13-76
TECH APPROVAL A. CONLEY 4-15-76
CSD APPROVAL T.T. for R.L. HARRINGTON

390,000 DWT TANKER

MOORING INSTALLATION DETAILS

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO. 309 & 310

DWG NO. 1203-52 SEE NOTE 2 REV H SHEET NO. 1 OF 19

NNIS-17X22 (REV. 1)

1203-52

MICRO-MASTER 105 mm

K+E

SEPT. '80

6X

FABRICATION NOTES

REV. H ADDED 3-23-79

THE NOTES BELOW AND THE ONES MARKED Ø ARE FOR NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY USE FOR FABRICATION AND ERECTION PURPOSES ONLY. THEIR ADDITION TO THIS PLAN IS NOT MADE UNDER THE SUPERVISION OF THE HULL DESIGN DIVISION, THUS, THEY CAN IN NO WAY BE CONSTRUED AS AFFECTING OR MODIFYING THE DESIGN DEPICTED HEREIN OR ANY NON-DEVIATIONAL REQUIREMENTS.

DWG. 1203-52 REV. B,C,D,E,F, G

1. X-14 MOLD LOFT C D E F

   A. FURNISH MOLDS AND/OR TAPES TO X-15 FAB. SHOP FOR ALL MATERIAL.
   B. LEAVE ADDED MATERIAL AS MARKED IN BODY OF DRAWING AND ESTABLISH DESIGN CUT LINES IWO ADDED MATERIAL, PUNCH MARK SAME.

2. X-15 FAB. SHOP C D E F

   A. FURNISH ALL MATERIAL TO X-16 STEEL PRODUCTION SHOP FOR ALL MATERIAL AS PER MOLDS AND/OR TAPES.

3. X-16 STEEL PRODUCTION SHOP D E F H

   A. PREASSEMBLE DIRECTIONAL CHANGE SHEAVE SPRT. (SHEET 3 DETAILS 3D & 3F) INTO INDIVIDUAL UNITS INCLUDING SHEAVE PART #7 FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 1806 & 0404 UNITS.
   B. PREASSEMBLE FDN FOR FLEET ANGLE ELIMINATOR (SHEET 3 DETS. 3B & 3E) INTO INDIVIDUAL UNITS. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 0404 AND 1806 UNITS.
   C. PREASSEMBLE FDN FOR 1ST LINE ASHORE HAWSER REEL (SHEET 3 DETS. 3B & 3E) INTO INDIVIDUAL UNITS. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 1806 & 0404 UNITS.
   D. PREASSEMBLE COAMING FOR W.T. COVER (SHEET 4, DET. 4-A) INTO INDIVIDUAL UNITS INCLUDING COVER FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 0405 AND 1806 UNITS.
   E. PREASSEMBLE FDN FOR CLOSED CHOCK (SHEET 5, DETAILS 5B, 5D, 5D1, 5E, 5F, 15E AND 15F INTO A UNIT. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 1806 UNIT.
   F. PREASSEMBLE FDN FOR CLOSED CHOCK (SHEET 5, DETAILS 5A, 5D, 5D1, 5E, 5F, 15E AND 15F INTO A UNIT. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 1805 UNIT.
   G. PREASSEMBLE FDN FOR CLOSED CHOCK (SHEET 5, DETAILS 5C, 5D, 5D1, 5E, 5F, 15F AND 15E INTO A UNIT. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 1805 UNIT.
   H. PREASSEMBLE FDN FOR CLOSED CHOCK (SHEET 6, DETAILS 6A, 6B, 6C, 6D, 6E, 6F AND 6G) INTO INDIVIDUAL UNITS INCLUDING CHOCK FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 0307, 0507, 0707, 1007, 1207, 1307 AND 1407 UNITS.
   I. PREASSEMBLE FDNS FOR LINE SUPPORT AND GUIDE (SHEET 7, DETAILS 7A, 7B, 7B1, 7C 7D, 7E AND 7F) INTO INDIVIDUAL UNITS. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 0306, 0506 AND 1306 UNITS.
   J. PREASSEMBLE FDNS FOR LINE SUPPORT AND GUIDE (SHEET 8, DETAILS 8A, 8B, 7E, 8C, 8D, 8E, 7B AND 7B1) INTO INDIVIDUAL UNITS. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 0306, 0506, 1206 AND 1306 UNITS.
   K. PREASSEMBLE FDNS FOR CHAIN STOPPER (SHEET 9, DETAILS 9B, 9B1, 9A, 9A1, 9C AND 9D) INTO INDIVIDUAL UNITS INCLUDING CHAIN STOPPER PAD FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 1806 UNIT.
   L. PREASSEMBLE FDN FOR CLOSED CHOCK (SHEET 10, DETAILS 10F, 5D4, 5D5, 5F2, 15F2, 15E AND 5E) INTO INDIVIDUAL UNITS. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 1806 UNIT.
   M. PREASSEMBLE FDN FOR CLOSED CHOCK (SHEET 10, DETAILS 10E, 5D2, 5D3, 5E, 5F1, 15F1 AND 15E) INTO INDIVIDUAL UNITS. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 1806 UNIT.
   N. PREASSEMBLE FDN FOR CLOSED CHOCK (SHEET 10, DETAILS 10A, 10D, 10D1, 10B, 10C AND 5E1) INTO INDIVIDUAL UNITS. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 0405 AND 1407 UNITS.
   O. PREASSEMBLE FDN FOR ROLLER FAIRLEAD (SHEET 11, DETAILS 11A & 11B) INTO A UNIT INCLUDING ROLLER FAIRLEAD FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 0405 UNIT.
   P. PREASSEMBLE FDN FOR ROLLER FAIRLEAD (SHEET 11, DETAILS 11C & 11D). INTO A UNIT INCLUDING ROLLER FAIRLEAD FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 0405 UNIT.
   Q. PREASSEMBLE FDN FOR ROLLER FAIRLEAD (SHEET 11, DETAILS 11E & 11F) INTO A UNIT INCLUDING ROLLER FAIRLEAD FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 0405 UNIT.
   R. PREASSEMBLE FDN FOR ROLLER FAIRLEAD (SHEET 12, DETAILS 12E & 12F) INTO A UNIT INCLUDING ROLLER FAIRLEAD FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 0507 AND 1307 UNITS.
   S. PREASSEMBLE FDN FOR ROLLER FAIRLEAD (SHEET 12, DETAILS 12C, 12C1, 12D & 12D1) INTO A UNIT INCLUDING ROLLER FAIRLEAD FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 0307, 0507, 1207 AND 1307 UNITS.

HULL NO. 613C & 614C	DWG NO. 1203-52	REV. D
		SHEET 1A

1203-52

SEPT. '80

6X

FABRICATION NOTES

REV. H ADDED 3-23-79

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3. X-16 STEEL PRODUCTION SHOP (CON'T)

T. PREASSEMBLE FDN FOR ROLLER FAIRLEAD (SHEET 12, DETAILS 12A, 12A1, 12B AND 12B1) INTO INDIVIDUAL UNITS INCLUDING ROLLER FAIRLEAD FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 0307 AND 1207 UNITS.

U. PREASSEMBLE FDN FOR LINE SUPPORT AND GUIDE (SHEET 13, DETAILS 13A, 13B, 13B1, 13C, 13D AND 7E) INTO A UNIT. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 1506 UNIT.

V. PREASSEMBLE FDN FOR ROLLER FAIRLEAD (SHEET 14, DETAILS 14A, 14A1 AND 14B) INTO UNITS INCLUDING ROLLER FAIRLEAD FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 1805 UNIT.

W. PREASSEMBLE FDN FOR ROLLER FAIRLEAD (SHEET 14, DETAILS 14E, 14E1 AND 14F) INTO INDIVIDUAL UNITS INCLUDING ROLLER FAIRLEAD FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 1805 UNIT.

X. PREASSEMBLE FDN FOR ROLLER FAIRLEAD (SHEET 15, DETAILS 15A & 15B) INTO A UNIT INCLUDING ROLLER FAIRLEAD FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 1806 UNIT.

Y. PREASSEMBLE FDN FOR ROLLER FAIRLEAD (SHEET 15, DETAILS 15C AND 15D) INTO A UNIT INCLUDING ROLLER FAIRLEAD FROM DWG. 1203-51. SEND TO FINAL ASSEMBLY PLATEN TO ASSEMBLE WITH 1806 UNIT.

Z. PREASSEMBLE FDN FOR CLOSED CHOCK (SHT #16, DETS 16A, 16B, 16B1, 16C, 16D, 16E, 16F) INTO A COMPLETE UNIT. SEND TO SHIP — TO ASSEMBLE WITH 0405 UNIT.

6. FINAL ASSEMBLY PLATEN (X-11) C

A. ASSEMBLE FDNS WITH ITS RESPECTIVE ASSEMBLIES AS MARKED IN BODY OF PLAN.

7. X-11 SHIPFITTERS (DOCK) F H

A. INSTALL COMPLETED FDNS FOR CLOSED CHOCK (NOTE 3-Z) & TOWING BRKT (NOTE 3-AA) IN PLACE ON SHIP.

B. INSTALL COMPLETED PIPE GUARDS SHT 18 (614 ONLY) AND SHT 19 (613 ONLY) IN PLACE ON SHIP.

4. M50 MACHINE SHOP F G

AA. PREASSEMBLE FDN FOR TOWING BRKT, EXCEPT PART #22 IN DET 17-G; (SHT #17, DETS 17A, 17B, 17C, 17D, 17E, 17F, 17H) INTO A COMPLETE UNIT. SEND TO SHIP — TO ASSEMBLE WITH 0405 UNIT.

5. OA H

A. OA TO FURNISH PIPE GUARDS SHT 18 (614 ONLY) AND SHT 19 (613 ONLY) TO SHIPFITTERS

HULL NO. 613C & 614C	DWG NO. 1203-52	REV. D
		SHEET 1B

1203-52

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
Registered trade-mark of KEUFFEL & ESSER CO

SEPT. '80

6X

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21.	STD. PIPE HANGERS AND INSTALLATION	257056

REVISIONS CONT

COST CHG NO NN	COST CHG NO OWNERS	REV	SH NO.	DESCRIPTION	NNS & DD CO DATE	NNS & DD CO AUTHD	USN DATE	USN APPD
		H	2	REF 21 ADDED.				
			18	ADDED.				
			19	ADDED.				
				WORK ACCOMPLISHED ON HULL 613C BY LIAISION MEM # 570. ALL TO SUIT DESIGN DEVELOPMENT & OWNERS REQUEST.			NG MGR 3-22-79	
			4	IN DET. 4-A I.D. REVISED FROM $10\frac{5}{8}$ TO $11\frac{5}{8}$. WORK ACCOMPLISHED ON 613C BY LIAISION 613C RWS-3. INSIDE DIA OF COAMING REVISED TO UTILIZE COVER AS FABRICATED. JLC HLB	RWS 3-16-79			

REVISIONS								
COST CHG NO. NN	COST CHG NO. OWNERS	REV	SH NO.	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	USN DATE	USN APPD
10$72		A	N	INITIAL ISSUE				
		B	1 5	NOTE 4-REV TO INCLUDE APPROVAL BY OWNERS REPRESENTATIVE.				
			10 11 14 15	SECT 5-F1-$21\frac{1}{2}$ DIM ALT FROM 11 & 40.8# PL ALT TO 56.1# PL. SECT 5-D2, 5-D3 & 15-F1 40.8# PL ALT TO 56.1# PL.				
				DET 10-A, SECT 10-B, 10-C, 10-D & 10-D1-ADDED FDN BENEATH CLOSED CHOCK. ADDED SECT 10-G & DET 5-E1. INCR HT OF FAIRLEADER IN SECT 11-B FROM $34\frac{1}{4}$ TO $35\frac{3}{4}$, SECT 11-D FROM 25 TO 27 & SECT 11-F FROM 41 TO 42. REVISED SLOPE OF FAIRLEADER SECT 11-B FROM $1\frac{3}{8}$ TO $1\frac{5}{16}$, SECT 11-D FROM $\frac{15}{16}$ TO $\frac{7}{8}$ & SECT 11-F FROM $1\frac{1}{2}$ TO $1\frac{7}{16}$. DET 14-C, 14-C1 & SECT 14-D VOIDED. ALL TO SUIT OWNERS COMMENT PRINT ON REV A & LTR DATED 5-14-76.				
			GEN	ADDED N.N. MFG PC MARKS THRU-OUT & SECT 13-D ADDED. ALL TO FACILITATE FABRICATION. HLB L	RWS 7/8/76			
		C	3 6	DET 3-A-HAWSER REEL RELOC FROM $5\frac{7}{8}$ TO $4\frac{3}{8}$ & DIRECT CHG SH RELOC FROM 23 TO $21\frac{1}{2}$.				
			13	DET 6-A1 ADDED				
			15	ALL TO DEVELOPMENT OF BACKING-UP STRUCT				
				DET 13-A-PADS ADDED UNDER LEGS OF LINE SPRT & GUIDE. ELEV 13-B, 13-B1, 13-C REV & DET 13-E ADDED. ALL TO SUIT HTD REQUIREMENTS				
				SECT 15-D-HT OF FAIRLEADER REV FROM $16\frac{1}{4}$ TO 20 & SLOPE REV FROM $1\frac{1}{16}$ TO $\frac{15}{16}$. SECT 15-B-HT OF FAIRLEADER REV FROM $24\frac{3}{16}$ TO $28\frac{1}{2}$ & SLOPE REV FROM $1\frac{3}{8}$ TO $1\frac{3}{16}$. ALL TO SUIT DEVELOPMENT OF 1ST LINE ASHORE WINCH FDN. HLB L	RWS			
		D	3	DET 6-A1, 6-A2, SECT 6-C & DET 13-E-ADDED PC MARK NOS				
			6	DET 6-A2-ADDED. ALL TO SUIT DEV OF BACK-UP STR				
			13	DET 3-A-HAWSER REEL RELOC FROM 36'-3 TO 36'-4 OFF CL & FROM $4\frac{3}{8}$ FWD FR-1 TO $11\frac{1}{2}$ FWD FR 4. DIR CHG SHEAVE RELOC. TO IMPROVE ACCESS. HLB L	RWS			
		E	3 4	FDN ADDED FOR BOW CHOCK. DET 4-D & SECT 4-F REV. SECT 4-G, 4-G1 & 4-H ADDED ALL TO SUIT DESIGN DEVELOPMENT.				
				DET 3-B & 3-D-DRILLING OF FDNS ADDED TO SUIT REQUEST BY MACHINERY DESIGN HLB L	RWS 2-22-77			
85		F	16 17	ON ADDED SHT 16-ADDED DET 16-A, 16-C, 16-F, ELEV 16-B, 16-B1, SECT 16-D & 16-E. ON ADDED SHT 17 ADDED DETAILS 17-A, 17-G, 17-H, ELEV 17-B, SECT 17-C, 17-D, 17-E & 17-F. ALL TO SUIT OWNERS REQUEST LTR 76V DATED 2-10-76 THIS REV IS A PART OF N.N. CHG NO. 85 HLB AJH	RWS			
NG 4-1-78 —	—	G	1	NOTE 7-ADDED				
			17	IN SECT 17-C-NOTE 7 ADDED.				
				ALL TO SUIT DESIGN DEVELOPMENT HLB	RWS 2-16-78			

PWH 5-13-76

PWH 11-30-76

PWH 2-2?-77

AC 11/1/77

HULL NO. 613C & 614C	DWG. NO. 1203-52	REV. H
		SHEET 2

NN14-17 X 22 (REV. 1)

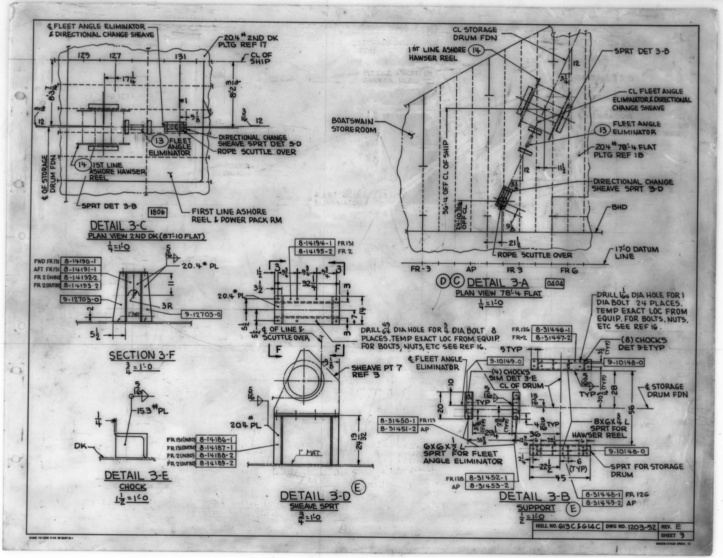
1203-52

MICRO-MASTER 105 mm

K+E

SEPT. '80

6X


℄ FLEET ANGLE ELIMINATOR & DIRECTIONAL CHANGE SHEAVE
20.4# 2ND DK PLTG REF 17
CL OF SHIP
125
127
131
17 1/4
8'-3 7/16
8'-2 3/4
#1
9 1/8
3/16
12
DIRECTIONAL CHANGE SHEAVE SPRT DET 3-D
13 FLEET ANGLE ELIMINATOR
ROPE SCUTTLE OVER
14 1ST LINE ASHORE HAWSER REEL
℄ OF STORAGE DRUM FDN
SPRT DET 3-B
1806
FIRST LINE ASHORE REEL & POWER PACK RM
DETAIL 3-C
PLAN VIEW 2ND DK (87'-10 FLAT)
1/4 = 1'-0
CL STORAGE DRUM FDN
1ST LINE ASHORE 14 HAWSER REEL
SPRT DET 3-B
CL FLEET ANGLE ELIMINATOR & DIRECTIONAL CHANGE SHEAVE
BOATSWAIN STOREROOM
13 FLEET ANGLE ELIMINATOR
20.4# 78'-4 FLAT PLTG REF 18
36'-4 OFF CL OF SHIP
24'-10 7/16 OFF CL
11 1/2
5 1/4
9 3/4
21 1/2
DIRECTIONAL CHANGE SHEAVE SPRT 3-D
BHD
ROPE SCUTTLE OVER
17'-0 DATUM LINE
FR-3
AP
FR 3
FR 6
D C DETAIL 3-A
0404
PLAN VIEW 78'-4 FLAT
1/4 = 1'-0
FWD FR131 8-14190-1
AFT FR131 8-14191-1
FR 2 (INBD) 8-14192-2
FR 2 (OUTBD) 8-14193-2
9-12703-0
20.4# PL
3R
1" MAT
5 1/2
SECTION 3-F
3/4 = 1'-0
8-14194-1 FR131
8-14195-2 FR 2
9 3/4
32 1/4
14
20.4# PL
℄ OF LINE & SCUTTLE OVER
DRILL 49/64 DIA HOLE FOR 3/4 DIA BOLT 8 PLACES. TEMP EXACT LOC FROM EQUIP. FOR BOLTS, NUTS, ETC SEE REF 16.
SHEAVE PT 7 REF 3
20.4# PL
1" MAT
24 19/32
FR131 (INBD) 8-14186-1
FR131 (OUTBD) 8-14187-1
FR 2 (INBD) 8-14188-2
FR 2 (OUTBD) 8-14189-2
DETAIL 3-D E
SHEAVE SPRT
3/4 = 1'-0
15.3# PL
DK
DETAIL 3-E
CHOCK
1 1/2 = 1'-0
DRILL 1 1/64 DIA HOLE FOR 1 DIA BOLT 24 PLACES. TEMP EXACT LOC FROM EQUIP. FOR BOLTS, NUTS, ETC SEE REF 16.
FR126 8-31446-1
FR-2 8-31447-2
(8) CHOCKS DET 3-E TYP
5 TYP
9-10148-0
9-10149-0
℄ FLEET ANGLE ELIMINATOR
(4) CHOCKS SIM DET 3-E
CL OF DRUM
℄ STORAGE DRUM FDN
8-31450-1 FR129
8-31451-2 AP
6X6X1/2 L SPRT FOR FLEET ANGLE ELIMINATOR
8X6X3/4 L SPRT FOR HAWSER REEL
9-10148-0
SPRT FOR STORAGE DRUM
36
56
28
45
22 1/2
6 (TYP)
FR128 8-31452-1
AP 8-31453-2
8-31448-1 FR 126
8-31449-2 AP
DETAIL 3-B
SUPPORT E
1/2 = 1'-0
HULL NO. 613C & 614C
DWG NO. 1203-52
REV. E
SHEET 3
K&E 10 1253 7-74 W2047 B
MN15-17X22 (REV. 1)

1203-52

SEPT. '80

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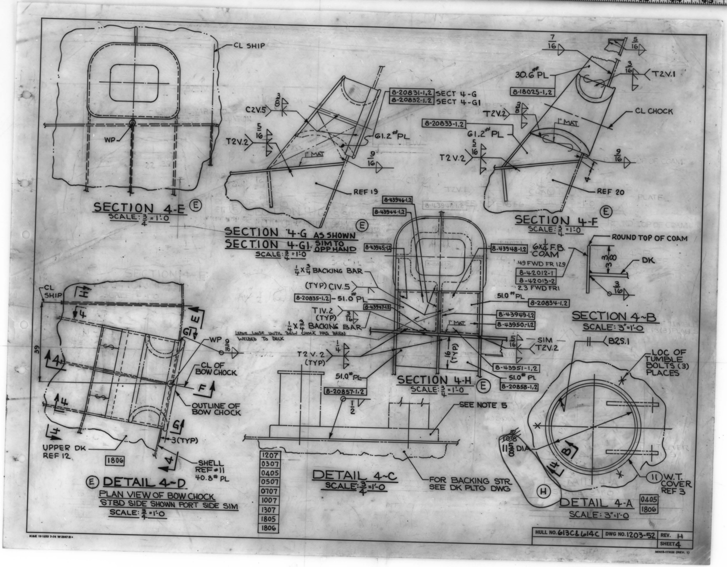
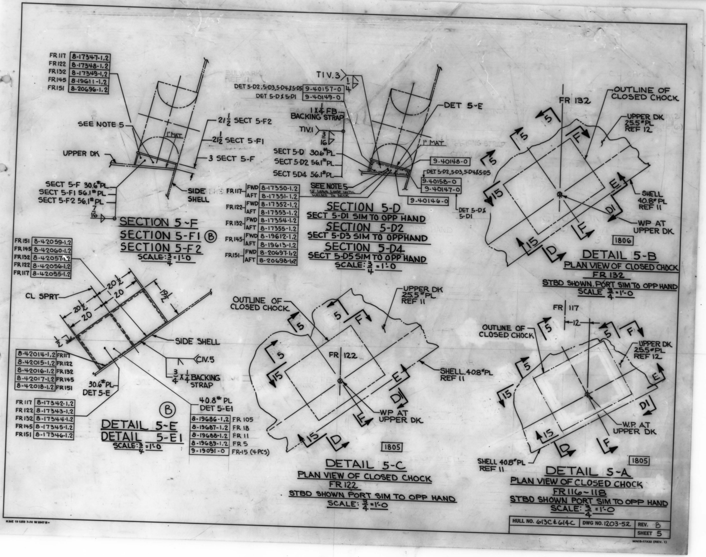

CL SHIP
WP
SECTION 4-E Ⓔ
SCALE: 3/4"=1'-0
C2V.5
T2V.2
8-20831-1,2 SECT 4-G
8-20832-1,2 SECT 4-G1
61.2# PL
1" MAT
REF 19
SECTION 4-G AS SHOWN
SECTION 4-G1 SIM TO OPP HAND Ⓔ
SCALE: 3/4"=1'-0
30.6# PL
8-18025-1,2
T2V.1
CL CHOCK
8-20833-1,2
61.2# PL
T2 V.2
REF 20
SECTION 4-F Ⓔ
SCALE: 3/4"=1'-0
8-43946-1,2
8-43944-1,2
8-43945-1,2
8-43948-1,2
1/4 X 3/4 BACKING BAR
(TYP) C1V.5
8-20835-1,2 – 51.0# PL
8-43947-1,2
T1V.2 (TYP)
1/4 X 3/4 BACKING BAR
LEAVE LOOSE UNTIL BOW CHOCK HAS BEEN WELDED TO DECK
51.0# PL
8-20834-1,2
8-43949-1,2
8-43950-1,2
1" MAT
SIM T2V.2
16 (TYP)
8-43951-1,2
51.0# PL
8-20858-1,2
T2 V.2 (TYP)
SECTION 4-H Ⓔ
SCALE: 3/4"=1'-0
6X1/2 F.B. COAM
ROUND TOP OF COAM
.49 FWD FR 129
8-42012-1
8-42013-2
2.3 FWD FR1
3 1/2
DK
SECTION 4-B
SCALE: 3"=1'-0
CL SHIP
39
CL OF BOW CHOCK
OUTLINE OF BOW CHOCK
3 (TYP)
UPPER DK REF 12
SHELL REF #11 40.8# PL
1806
Ⓔ DETAIL 4-D
PLAN VIEW OF BOW CHOCK
STBD SIDE SHOWN PORT SIDE SIM
SCALE: 3/4"=1'-0
51.0# PL
8-20857-1,2
SEE NOTE 5
FOR BACKING STR. SEE DK PLTG DWG
DETAIL 4-C
SCALE: 3/4"=1'-0
1207
0307
0405
0507
0707
1007
1307
1805
1806
B2S.1
LOC OF TUMBLE BOLTS (3) PLACES
11 5/8 DIA
W.T. COVER REF 3
Ⓗ
DETAIL 4-A
SCALE: 3"=1'-0
0405
1806
HULL NO. 613C&614C
DWG NO. 1203-52
REV. H
SHEET 4
K&E 10 1253 7-74 W 2847 B
MN15-17X22 (REV. 1)

1203-52

MICRO-MASTER 105 mm

SEPT. '80

6X


FR117 8-17347-1,2
FR122 8-17348-1,2
FR132 8-17349-1,2
FR145 8-19611-1,2
FR151 8-20696-1,2
SEE NOTE 5
21 1/2 SECT 5-F2
21 1/2 SECT 5-F1
3 SECT 5-F
1" MAT
UPPER DK
SECT 5-F 30.6#PL
SECT 5-F1 56.1#PL
SECT 5-F2 56.1#PL
7/16
SIDE SHELL
SECTION 5-F
SECTION 5-F1 Ⓑ
SECTION 5-F2
SCALE: 3/4 = 1'-0
TIV.3
1/4
DET 5-D2, 5-D3, 5-D4 & 5-D5 9-40157-0
DET 5-D & 5-D1 9-40149-0
1 X 1/4 FB BACKING STRAP
TIV.1
3/16
SECT 5-D 30.6#PL
SECT 5-D2 56.1#PL
SECT 5D4 56.1#PL
SEE NOTE 5
SF LEAVE LOOSE UNTIL WELDED TO DECK
DET 5-E
1" MAT
9-40148-0
DET 5-D2, 5-D3, 5-D4 & 5-D5
9-40158-0
9-40147-0
9-40146-0
DET 5-D & 5-D1
FR117 FWD 8-17350-1,2
FR117 AFT 8-17351-1,2
FR122 FWD 8-17352-1,2
FR122 AFT 8-17353-1,2
FR132 FWD 8-17354-1,2
FR132 AFT 8-17355-1,2
FR145 FWD 8-19612-1,2
FR145 AFT 8-19613-1,2
FR151 FWD 8-20697-1,2
FR151 AFT 8-20698-1,2
SECTION 5-D
SECT 5-D1 SIM TO OPP HAND
SECTION 5-D2
SECT 5-D3 SIM TO OPPHAND
SECTION 5-D4
SECT 5-D5 SIM TO OPP HAND
SCALE: 3/4 = 1'-0
FR 132
OUTLINE OF CLOSED CHOCK
5
5
5
F
UPPER DK 25.5#PL REF 12
15
E
SHELL 40.8#PL REF 11
D1
WP AT UPPER DK
F
15
D
1806
DETAIL 5-B
PLAN VIEW OF CLOSED CHOCK
FR 132
STBD SHOWN. PORT SIM TO OPP HAND
SCALE 3/4 = 1'-0
FR151 8-42059-1,2
FR145 8-42060-1,2
FR132 8-42057-1,2
FR122 8-42056-1,2
FR117 8-42055-1,2
CL SPRT
20 1/2
20
19 1/2
20 1/2
20
1/2
SIDE SHELL
CIV.5
3/4 X 1/4 BACKING STRAP
8-42014-1,2 FR117
8-42015-1,2 FR122
8-42016-1,2 FR132
8-42017-1,2 FR145
8-42018-1,2 FR151
30.6#PL DET 5-E
FR117 8-17342-1,2
FR122 8-17343-1,2
FR132 8-17344-1,2
FR145 8-17345-1,2
FR151 8-17346-1,2
Ⓑ
40.8#PL DET 5-E1
8-19686-1,2 FR 105
8-19687-1,2 FR 18
8-19688-1,2 FR 11
8-19689-1,2 FR 5
9-19091-0 FR-15 (4 PCS)
DETAIL 5-E
DETAIL 5-E1
SCALE: 3/4 = 1'-0
OUTLINE OF CLOSED CHOCK
UPPER DK 25.5#PL REF 11
5
5
F
5
FR 122
15
E
SHELL, 40.8#PL REF 11
D1
WP AT UPPER DK
F
15
D
1805
DETAIL 5-C
PLAN VIEW OF CLOSED CHOCK
FR122
STBD SHOWN PORT SIM TO OPP HAND
SCALE: 3/4 = 1'-0
FR 117
12
OUTLINE OF CLOSED CHOCK
5
5
F
UPPER DK 25.5#PL REF 12
5
E
15
D1
W.P. AT UPPER DK
15
D
F
SHELL 40.8#PL REF 11
1805
DETAIL 5-A
PLAN VIEW OF CLOSED CHOCK
FR116-118
STBD SHOWN PORT SIM TO OPP HAND
SCALE: 3/4 = 1'-0
HULL NO. 613C & 614C
DWG NO. 1203-52
REV. B
SHEET 5
K&E 19 1253 7-74 W2047 B+
MN15-17X22 (REV. 1)

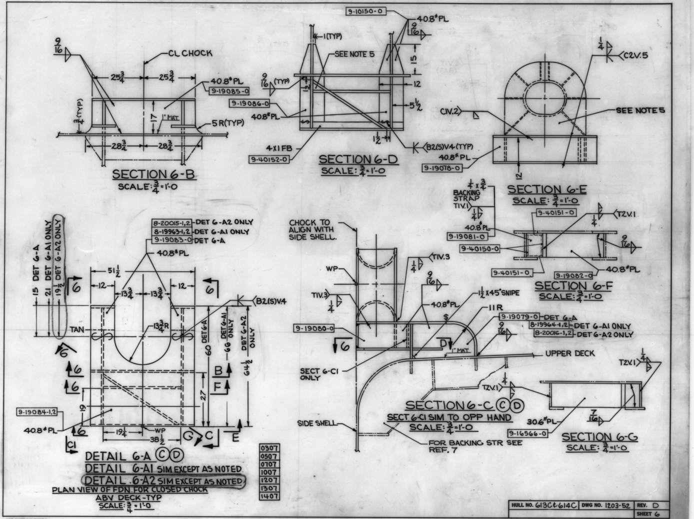
1203-52

MICRO-MASTER 105 mm

K+E

SEPT. '80

6X


9/16
CL CHOCK
25 3/4
25 3/4
40.8# PL
9-19085-0
3/4 (TYP)
17
1" MAT
5R (TYP)
28 3/4
28 3/4
9-10150-0
40.8# PL
9/16
1 (TYP)
SEE NOTE 5
15
9/16 (TYP)
12
9-19086-0
5 1/2
40.8# PL
1/2
1 1/2
4X1 FB
B2(S)V4 (TYP)
9-40152-0
1/4
C2V.5
C1V.2
SEE NOTE 5
40.8# PL
9-19078-0
12
1/4 x 3/4 BACKING STRAP T1V.1
1/4
9-40151-0
T2V.1
40.8# PL
1/4
9-19081-0
9/16
9-40150-0
9-40151-0
9-19082-0
40.8# PL
8-20015-1,2 DET 6-A2 ONLY
8-19963-1,2 DET 6-A1 ONLY
9-19083-0 DET 6-A
40.8# PL
15 DET 6-A
21 DET 6-A1 ONLY
19 1/2 DET 6-A2 ONLY
51 1/2
12
13 3/4
13 3/4
12
6
6
B2(S)V4
TAN
13 3/4 R
60 DET 6-A
66 DET 6-A1 ONLY
64 1/2 DET 6-A2 ONLY
6
6
6
B
F
27
19
9-19084-1,2
40.8# PL
6
19 1/4
WP
38 1/2
G
C
E
C1
CHOCK TO ALIGN WITH SIDE SHELL.
WP
1/4
T1V.3
9/16
T1V.3
1/4
1 1/2 X 45° SNIPE
40.8# PL
11R
9-19080-0
6
9-19079-0 DET 6-A
8-19964-1,2 DET 6-A1 ONLY
8-20016-1,2 DET 6-A2 ONLY
9/16
D
1" MAT
UPPER DECK
SECT 6-C1 ONLY
T2V.1
1/4
T2V.1
1/4
SIDE SHELL
30.6# PL
9-16566-0
7/16
FOR BACKING STR SEE REF. 7

SECTION 6-B
SCALE: $\frac{3}{4}$=1'-0

SECTION 6-D
SCALE: $\frac{3}{4}$=1'-0

SECTION 6-E
SCALE: $\frac{3}{4}$=1'-0

SECTION 6-F
SCALE: $\frac{3}{4}$=1'-0

SECTION 6-C Ⓒ Ⓓ
SECT 6-C1 SIM TO OPP HAND
SCALE: $\frac{3}{4}$=1'-0

SECTION 6-G
SCALE: $\frac{3}{4}$=1'-0

DETAIL 6-A Ⓒ Ⓓ
DETAIL 6-A1 SIM EXCEPT AS NOTED
DETAIL 6-A2 SIM EXCEPT AS NOTED
PLAN VIEW OF FDN. FOR CLOSED CHOCK
ABV DECK-TYP
SCALE: $\frac{3}{4}$=1'-0

0307
0507
0707
1007
1207
1307
1407

HULL NO. 613C & 614C	DWG NO. 1203-52	REV. D
		SHEET 6

K&E 19 1233 7-74 W2847 B

MN15-17X22 (REV. 1)

1203-52

MICRO-MASTER 105 mm

K+E

SEPT. '80

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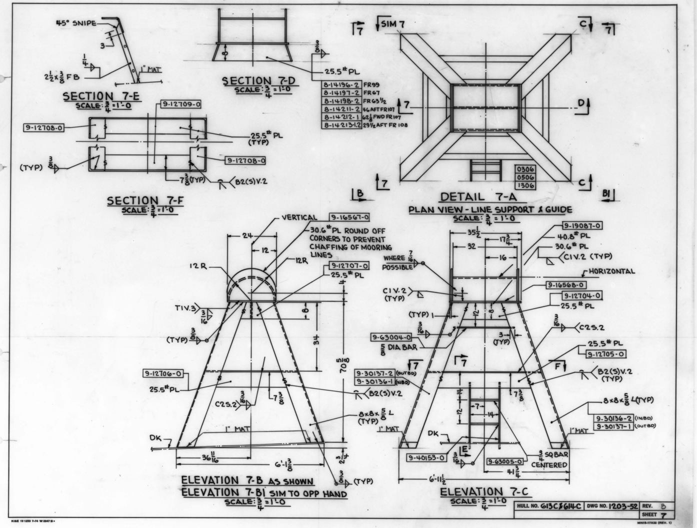
45° SNIPE
3
1/4
2 1/2 x 3/8 FB
1" MAT
3/8
25.5# PL
8-14196-2 FR99
8-14197-2 FR67
8-14198-2 FR63 1/2
8-14211-2 46 AFT FR107
8-14212-1 62 1/8 FWD FR107
8-14213-1.2 29 1/2 AFT FR 108
8
9-12709-0
9-12708-0
25.5# PL (TYP)
(TYP) 3/8
9-12708-0
7 3/8 (TYP)
B2(S)V.2
7
SIM 7
C
7
7
D
B
7
C
B1
0306
0506
1306
VERTICAL
9-16567-0
30.6# PL ROUND OFF CORNERS TO PREVENT CHAFFING OF MOORING LINES
24
12
12 R
12R
9-12707-0
25.5# PL
4
T1V.3
3/16
8
(TYP) 3/8
34
70 5/8
9-12706-0
25.5# PL
C2S.2 3/16
7 3/8
B2(S)V.2
8x8x 5/8 L (TYP)
1" MAT
DK
36 11/16
6'-1 3/8
2 3/4
3/8 (TYP)
35 1/2
17 3/4
32
16
9-19087-0
40.8# PL
30.6# PL
C1V.2 (TYP)
WHERE 7/16 POSSIBLE
HORIZONTAL
9-16568-0
C1V.2 (TYP)
9-12704-0
25.5# PL
(TYP) 1
12
8
3/16
C2S.2
9-63004-0
5/8 DIA BAR
3 (TYP)
25.5# PL
9-12705-0
7
7
F
9-30137-2 (OUTBD)
9-30136-1 (INBD)
B2(S)V.2 (TYP)
B2(S)V.2
7 3/8
8x8x 5/8 L (TYP)
1" MAT
7
12
14
9-30136-2 (INBD)
9-30137-1 (OUTBD)
1" MAT
DK
E
9-40153-0
3/16
9-63005-0
3/4 SQ BAR CENTERED
41 3/4
6'-11 1/2

SECTION 7-E
SCALE: 3/4 = 1'-0

SECTION 7-D
SCALE: 3/4 = 1'-0

SECTION 7-F
SCALE: 3/4 = 1'-0

DETAIL 7-A
PLAN VIEW - LINE SUPPORT & GUIDE
SCALE: 3/4 = 1'-0

ELEVATION 7-B AS SHOWN
ELEVATION 7-B1 SIM TO OPP HAND
SCALE: 3/4 = 1'-0

ELEVATION 7-C
SCALE: 3/4 = 1'-0

HULL NO. 613C & 614C	DWG NO. 1203-52	REV. B
		SHEET 7

K&E 19 1253 7-74 W 2847 B •

MN15-17X22 (REV. 1)

1203 - 52

MICRO-MASTER 105 mm

K+E

SEPT. '80

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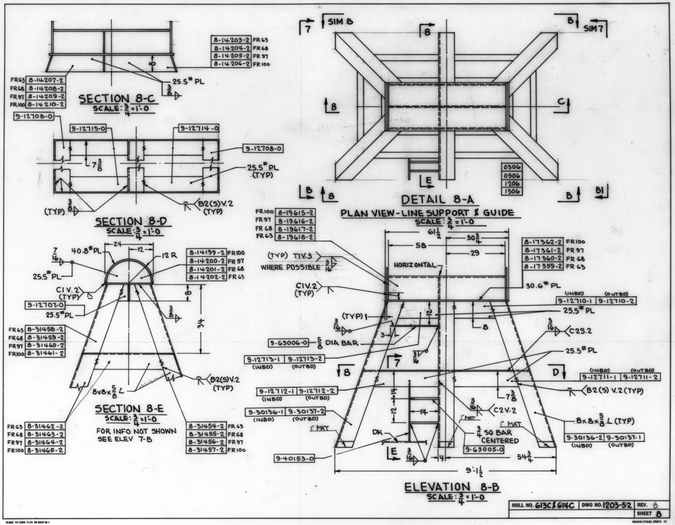

8-14203-2 FR63
8-14204-2 FR68
8-14205-2 FR97
8-14206-2 FR100
FR63 8-14207-2
FR68 8-14208-2
FR97 8-14209-2
FR100 8-14210-2
8
25.5# PL
3/8
SECTION 8-C
SCALE: 3/4 = 1'-0
9-12708-0
9-12715-0
9-12714-0
9-12708-0
7 3/8
25.5# PL (TYP)
(TYP) 3/8
B2(S)V.2 (TYP)
SECTION 8-D
SCALE: 3/4 = 1'-0
24
12
7/16
40.8# PL
12 R
25.5# PL
8-14199-2 FR100
8-14200-2 FR97
8-14201-2 FR68
8-14202-2 FR63
C1V.2 (TYP)
9-12707-0
25.5# PL
8
3/8
34
FR63 8-31458-2
FR68 8-31459-2
FR97 8-31460-2
FR100 8-31461-2
8x8x5/8 L
B2(S)V.2 (TYP)
SECTION 8-E
SCALE: 3/4 = 1'-0
FOR INFO NOT SHOWN SEE ELEV 7-B
FR63 8-31462-2
FR68 8-31463-2
FR97 8-31464-2
FR100 8-31465-2
8-31454-2 FR63
8-31455-2 FR68
8-31456-2 FR97
8-31457-2 FR100
7 SIM 8
8
B SIM 7
8
C
0306
0506
1206
1306
E
B 8
B B1
DETAIL 8-A
PLAN VIEW - LINE SUPPORT & GUIDE
SCALE: 3/4 = 1'-0
FR100 8-19615-2
FR97 8-19616-2
FR68 8-19617-2
FR63 8-19618-2
61 1/2
30 3/4
58
29
8-17362-2 FR100
8-17361-2 FR97
8-17360-2 FR68
8-17359-2 FR63
(TYP) T1V.3 WHERE POSSIBLE 3/16
HORIZONTAL
C1V.2 (TYP)
30.6# PL
(INBD) 9-12710-1
(OUTBD) 9-12710-2
25.5# PL
(TYP) 1
12
3/16
8
3/16 C2S.2
3
9-63006-0 5/8 DIA BAR
3/16
25.5# PL
9-12713-1 (INBD)
9-12713-2 (OUTBD)
7
8
D
(INBD) 9-12711-1
(OUTBD) 9-12711-2
9-12712-1 (INBD)
9-12712-2 (OUTBD)
B2(S) V.2 (TYP)
1 1/4
7 3/8
12
14
3/16 C2V.2
9-30136-1 (INBD)
9-30137-2 (OUTBD)
1" MAT
1" MAT
1" MAT
8x8x5/8 L (TYP)
3/4 SQ BAR CENTERED
9-30136-2 (INBD)
9-30137-1 (OUTBD)
DK
9-63005-0
E
3/16
4
54 3/4
9-40153-0
9'-1 1/2
ELEVATION 8-B
SCALE: 3/4 = 1'-0

HULL NO. 613C & 614C	DWG NO. 1203-52	REV. B
		SHEET 8

K&E 19 1253 7-74 W 2047 B+

MN15-17X22 (REV. 1)

1203 - 52

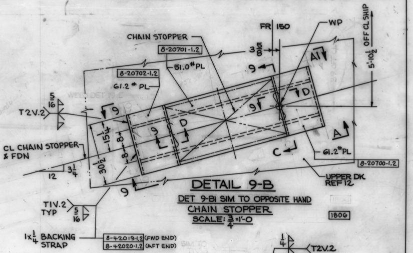
MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

KEUFFEL & ESSER CO

SEPT. '80

6X

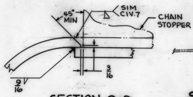

FR 150
WP
5'-10½ OFF CL SHIP
CHAIN STOPPER
8-20701-1,2
3 5/8
51.0# PL
8-20702-1,2
61.2# PL
9
A1
D
T2V.2
5/16
15¼
8
8
30½
CL CHAIN STOPPER & FDN
12
3¼
9
D
C
A
61.2# PL
8-20700-1,2
UPPER DK. REF 12
T1V.2 TYP
5/16
1x¼ BACKING STRAP
8-42019-1,2 (FWD END)
8-42020-1,2 (AFT END)
1806

DETAIL 9-B

DET 9-B1 SIM TO OPPOSITE HAND

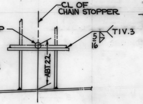
CHAIN STOPPER

SCALE: 3/4 = 1'-0


45° MIN
SIM C1V.7
CHAIN STOPPER
3/16
9/16

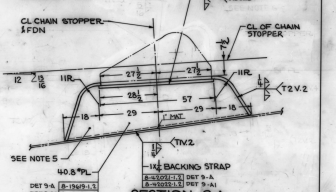
SECTION 9-D

SCALE: 3" = 1'-0


CL OF CHAIN STOPPER
WP
5/16
T1V.3
ABT 22

SECTION 9-C

SCALE: 3/4 = 1'-0


1/4
T2V.2
CL CHAIN STOPPER & FDN
CL OF CHAIN STOPPER
7½
12
13/16
11R
27½
27½
11R
1/4
T2V.2
28½
57
18
29
29
18
1" MAT
1/4
T1V.2
SEE NOTE 5
40.8# PL
1x¼ BACKING STRAP
8-42021-1,2 DET 9-A
8-42022-1,2 DET 9-A1
DET 9-A 8-19619-1,2
DET 9-A1 8-19620-1,2

SECTION 9-A

SECT 9-A1 SIM TO OPPOSITE HAND

SCALE: 3/4 = 1'-0

HULL NO. 613C&614C	DWG NO. 1203-52	REV. 8
		SHEET 9

K&E 10 1253 7-74 W 2347 D+

MN15-17X22 (REV. 1)

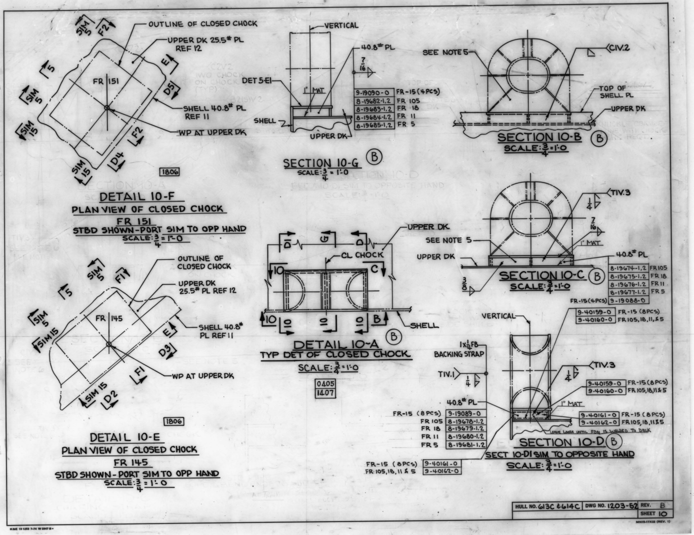
1203-52

MICRO-MASTER 105 mm

K+E

SEPT. '80

6X


OUTLINE OF CLOSED CHOCK
UPPER DK 25.5# PL REF 12
FR 151
SHELL 40.8# PL REF 11
WP AT UPPER DK
SIM 5
F2
E1
D5
D4
SIM 15
1806
VERTICAL
40.8# PL
7/16
DET 5-E1
1" MAT
SHELL
UPPER DK
9-19090-0 FR-15 (4PCS)
8-19682-1,2 FR 105
8-19683-1,2 FR 18
8-19684-1,2 FR 11
8-19685-1,2 FR 5
SEE NOTE 5
CIV.2
TOP OF SHELL PL
UPPER DK
TIV.3
1/4
7/16
SEE NOTE 5
UPPER DK
1" MAT
40.8# PL
3/8
8-19674-1,2 FR 105
8-19675-1,2 FR 18
8-19676-1,2 FR 11
8-19677-1,2 FR 5
FR-15 (4PCS) 9-19088-0
UPPER DK
CL CHOCK
D
G
C
10
B
SHELL
0405
1407
OUTLINE OF CLOSED CHOCK
UPPER DK 25.5# PL REF 12
FR 145
SHELL 40.8# PL REF 11
WP AT UPPER DK
SIM 5
SIM 15
F1
E1
D3
D2
1806
VERTICAL
9-40159-0 FR-15 (8PCS)
9-40160-0 FR 105, 18, 11, & 5
1x1/2 FB BACKING STRAP
TIV.1
1/4
TIV.3
1/4
40.8# PL
1" MAT
FR-15 (8PCS) 9-19089-0
FR 105 8-19678-1,2
FR 18 8-19679-1,2
FR 11 8-19680-1,2
FR 5 8-19681-1,2
9-40161-0 FR-15 (8PCS)
9-40162-0 FR 105, 18, 11 & 5
LEAVE LOOSE UNTIL FDN IS WELDED TO DECK
FR-15 (8PCS) 9-40161-0
FR 105, 18, 11 & 5 9-40162-0

DETAIL 10-F
PLAN VIEW OF CLOSED CHOCK
FR 151
STBD SHOWN - PORT SIM TO OPP HAND
SCALE: 3/4 = 1'-0

SECTION 10-G Ⓑ
SCALE: 3/4 = 1'-0

SECTION 10-B Ⓑ
SCALE: 3/4 = 1'-0

SECTION 10-C Ⓑ
SCALE: 3/4 = 1'-0

DETAIL 10-A Ⓑ
TYP DET OF CLOSED CHOCK
SCALE: 3/4 = 1'-0

DETAIL 10-E
PLAN VIEW OF CLOSED CHOCK
FR 145
STBD SHOWN - PORT SIM TO OPP HAND
SCALE: 3/4 = 1'-0

SECTION 10-D Ⓑ
SECT 10-D1 SIM TO OPPOSITE HAND
SCALE: 3/4 = 1'-0

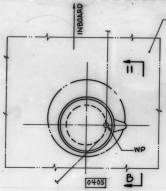
HULL NO. 613C & 614C	DWG NO. 1203-52	REV. B
		SHEET 10

K&E 19 1253 7-74 W 2847 B
MN15-17X32 (REV. 1)

1203 - 52

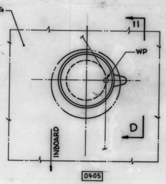
MICRO-MASTER 105 mm
K+E

SEPT. '80
6X


INBOARD
DK PLTG
11
WP
B
0405

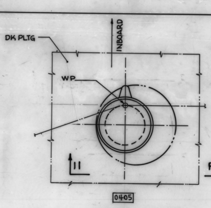
DETAIL 11-A

PLAN VIEW-20 ROLLER FAIRLEAD
FR 9 - FR 11 STBD
SCALE: $\frac{3}{4}$ = 1'-0


DK PLTG
11
WP
D
INBOARD
0405

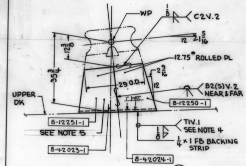
DETAIL 11-C

PLAN VIEW-20 ROLLER FAIRLEAD
FR 9 - FR 11 PORT
SCALE: $\frac{3}{4}$ = 1'-0


DK PLTG
INBOARD
WP
11
F
0405

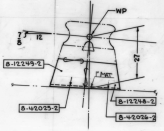
DETAIL 11-E

PLAN VIEW-20 ROLLER FAIRLEAD
FR-5 STBD
SCALE: $\frac{3}{4}$ = 1'-0


WP
$\frac{1}{8}$ C2V.2
12
$2\frac{15}{16}$
$12\frac{3}{8}$
$35\frac{3}{4}$
12.75# ROLLED PL
$2\frac{9}{16}$
29 O.D.
12
B2(S)V.2 NEAR & FAR
UPPER DK
1" MAT
8-12250-1
8-12251-1
SEE NOTE 5
TIV.1 SEE NOTE 4
$\frac{1}{8}$
$\frac{1}{4}$ × 1 FB BACKING STRIP
8-42023-1
8-42024-1

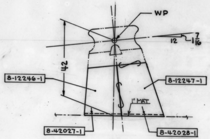
SECTION 11-B Ⓑ

SCALE: $\frac{3}{4}$ = 1'-0


WP
$\frac{7}{8}$
12
27
8-12249-2
1" MAT
8-12248-2
8-42025-2
8-42026-2

SECTION 11-D Ⓑ

FOR INFO NOT SHOWN SEE SECT 11-B
SCALE: $\frac{3}{4}$ = 1'-0


WP
12
$1\frac{7}{16}$
42
8-12246-1
8-12247-1
1" MAT
8-42027-1
8-42028-1

SECTION 11-F Ⓑ

FOR INFO NOT SHOWN SEE SECT 11-B
SCALE: $\frac{3}{4}$ = 1'-0

HULL NO. 613C & 614C	DWG NO. 1203-52	REV. B
		SHEET 11

K&E 10 1253 7-74 W 2247 B•

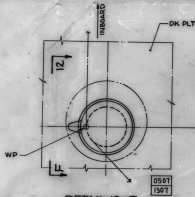
MN15-17X22 (REV. 1)

1203-52

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

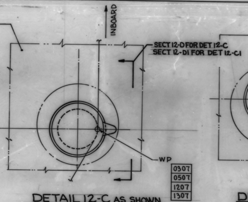
6X


INBOARD
DK PLTG
12
WP
F
0507
1307

DETAIL 12-E

PLAN VIEW 20" ROLLER FAIRLEAD

SCALE: $\frac{3}{4}$=1'-0

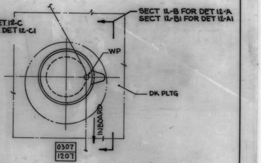

INBOARD
SECT 12-D FOR DET 12-C
SECT 12-D1 FOR DET 12-C1
WP
0307
0507
1207
1307

DETAIL 12-C AS SHOWN

DETAIL 12-C1 SIM EXCEPT AS NOTED

PLAN VIEW 20" ROLLER FAIRLEAD

SCALE: $\frac{3}{4}$=1'-0

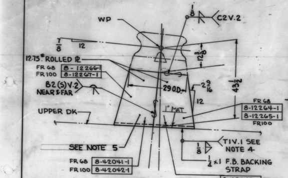

SECT 12-B FOR DET 12-A
SECT 12-B1 FOR DET 12-A1
WP
DK PLTG
INBOARD
0307
1207

DETAIL 12-A AS SHOWN

DETAIL 12-A1 SIM EXCEPT AS NOTED

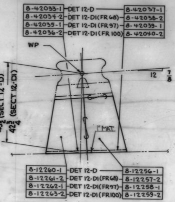
PLAN VIEW 20" ROLLER FAIRLEAD

SCALE: $\frac{3}{4}$=1'-0


WP
1/8
C2V.2
7/8
12
12.75# ROLLED PL
FR 68 8-12266-1
FR 100 8-12267-1
B2(S)V.2 NEAR & FAR
12 3/8
29 O.D.
2 9/16
12
43 1/2
1" MAT
FR 68
8-12264-1
8-12265-1
FR100
UPPER DK
SEE NOTE 5
1/8
T1V.1 SEE NOTE 4
FR 68 8-42041-1
FR 100 8-42042-1
1/4 x 1 F.B. BACKING STRAP
8-42043-1 FR68
8-42044-1 FR100

SECTION 12-F

SCALE: $\frac{3}{4}$=1'-0

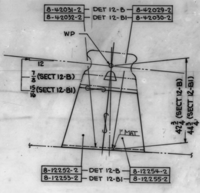

8-42033-1 DET 12-D 8-42037-1
8-42034-2 DET 12-D1(FR 68) 8-42038-2
8-42035-1 DET 12-D1 (FR 97) 8-42039-1
8-42036-2 DET 12-D1 (FR 100) 8-42040-2
WP
12
7/8
43 1/2 (SECT 12-D)
42 3/4 (SECT 12-D1)
1" MAT
8-12260-1 DET 12-D 8-12256-1
8-12261-2 DET 12-D1(FR68) 8-12257-2
8-12262-1 DET 12-D1(FR97) 8-12258-1
8-12263-2 DET 12-D1 (FR100) 8-12259-2

SECTION 12-D AS SHOWN

SECTION 12-D1 SIM EXCEPT AS NOTED

FOR INFO NOT SHOWN SEE SECT 12-F

SCALE: $\frac{3}{4}$=1'-0


8-42031-2 DET 12-B 8-42029-2
8-42032-2 DET 12-B1 8-42030-2
WP
12
7/8 (SECT 12-B)
15/16 (SECT 12-B1)
42 3/4 (SECT 12-B)
44 3/4 (SECT 12-B1)
1" MAT
8-12252-2 DET 12-B 8-12254-2
8-12253-2 DET 12-B1 8-12255-2

SECTION 12-B AS SHOWN

SECTION 12-B1 SIM EXCEPT AS NOTED

FOR INFO NOT SHOWN SEE SECT 12-F

SCALE: $\frac{3}{4}$=1'-0

HULL NO. 613C & 614C	DWG NO. 1203-52	REV. B
		SHEET 12

K&E 19 1253 3-72 2349+

MN15-17X22 (REV. 1)

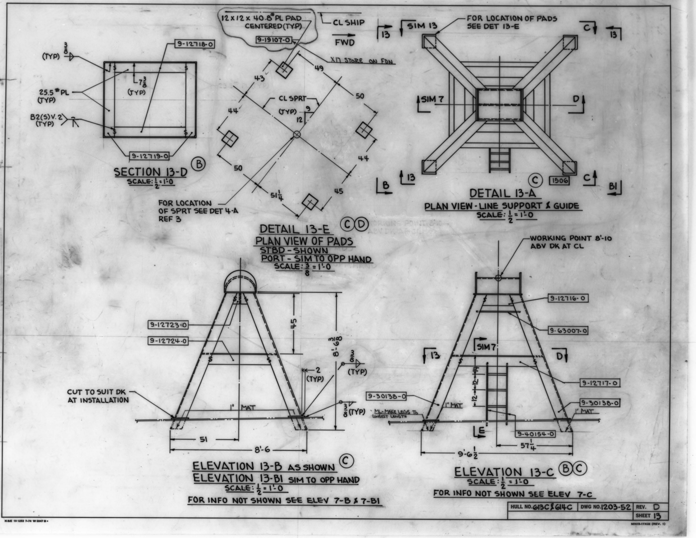
1203-52

MICRO-MASTER 105 mm

K+E

SEPT. '80

6X


12 x 12 x 40.8# PL PAD
CENTERED (TYP)
9-19107-0
CL SHIP
FWD
X17 STORE ON FDN
9-12718-0
(TYP) 3/8
7 3/8
(TYP)
25.5# PL
(TYP)
B2(S)V.2
(TYP)
9-12719-0
SECTION 13-D
Ⓑ
SCALE: 1/2 = 1'-0
43
49
50
44
CL SPRT
(TYP) 9
12
50
44
51 1/4
45
FOR LOCATION
OF SPRT SEE DET 4-A
REF 3
DETAIL 13-E
ⒸⒹ
PLAN VIEW OF PADS
STBD - SHOWN
PORT - SIM TO OPP HAND
SCALE: 3/8 = 1'-0
13
SIM 13
FOR LOCATION OF PADS
SEE DET 13-E
C
13
SIM 7
D
B
13
Ⓒ
1506
C
B1
DETAIL 13-A
PLAN VIEW - LINE SUPPORT & GUIDE
SCALE: 1/2 = 1'-0
9-12723-0
9-12724-0
45
8'-6 3/8
3/8
(TYP)
2
(TYP)
CUT TO SUIT DK
AT INSTALLATION
1" MAT
3/8 (TYP)
51
8'-6
ELEVATION 13-B AS SHOWN
Ⓒ
ELEVATION 13-B1 SIM TO OPP HAND
SCALE: 1/2 = 1'-0
FOR INFO NOT SHOWN SEE ELEV 7-B & 7-B1
WORKING POINT 8'-10
ABV DK AT CL
9-12716-0
9-63007-0
SIM 7
13
D
12
12
12
9-12717-0
9-30138-0
1" MAT
ML - MAKE LEGS TO LONGEST LENGTH
9-30138-0
1" MAT
E
9-40154-0
57 1/4
9'-6 1/2
ELEVATION 13-C
ⒷⒸ
SCALE: 1/2 = 1'-0
FOR INFO NOT SHOWN SEE ELEV 7-C
K&E 19 1255 7-74 W2847D
MN15-17X22 (REV. 1)

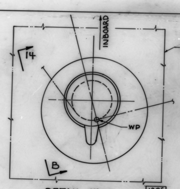
HULL NO. 613C & 614C	DWG NO. 1203-52	REV. D
		SHEET 13

1203 - 52

MICRO-MASTER 105 mm

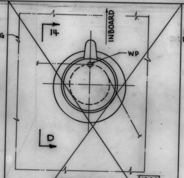
SEPT. '80

6X



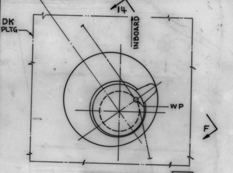
INBOARD
DK PLTG
14
WP
B
1805

DETAIL 14-A
PLAN VIEW-20 ROLLER FAIRLEAD
FR121 - FR123
DET 14-A1 SIM TO OPP HAND
SCALE: 3/4 = 1'-0



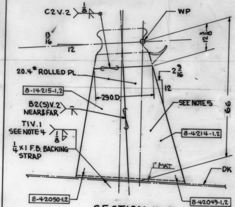
14
INBOARD
WP
D
1806

DETAIL 14-C
PLAN VIEW-20 ROLLER FAIRLEAD
FR136
DET 14-C1 SIM TO OPP HAND
SCALE: 3/4 = 1'-0
VOID Ⓑ



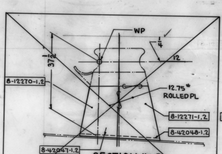
14
DK PLTG
INBOARD
WP
F
1805

DETAIL 14-E
PLAN VIEW- 20 ROLLER FAIRLEAD
FR 114 - FR116
DET 14-E1 SIM TO OPP HAND
SCALE: 3/4 = 1'-0



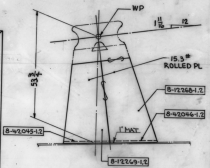
C2V.2
1/8
WP
13/16
12
12 3/8
20.4# ROLLED PL
2 9/16
8-14215-1,2
290 D
12
B2(S)V.2 NEAR&FAR
SEE NOTE 5
66
T1V.1 SEE NOTE 4
1/8
8-4214-1,2
1/4 x 1 F.B. BACKING STRAP
1" MAT
DK
8-42050-1,2
8-42049-1,2

SECTION 14-B
SCALE: 3/4 = 1'-0



WP
1/4
37 1/2
12
8-12270-1,2
12.75# ROLLED PL
8-12271-1,2
8-42048-1,2
8-42047-1,2

SECTION 14-D
FOR INFO NOT SHOWN SEE SECT 14-B
SCALE: 3/4 = 1'-0
VOID Ⓑ



WP
1 11/16
12
15.3# ROLLED PL
53 3/4
8-12268-1,2
8-42046-1,2
8-42045-1,2
1" MAT
8-12269-1,2

SECTION 14-F
FOR INFO NOT SHOWN SEE SECT 14-B
SCALE: 3/4 = 1'-0

HULL NO. 613C & 614C	DWG NO. 1203-52	REV. B
		SHEET 14

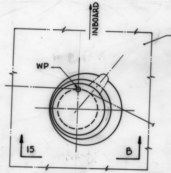
K&E 19 1253 7-74 W2047 B+

MN15-17X32 (REV. 1)

1203-52

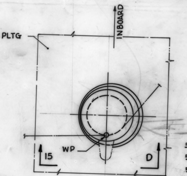
MICRO-MASTER 105 mm
K+E

SEPT. '80
6X


INBOARD
DK PLTG
WP
15
B

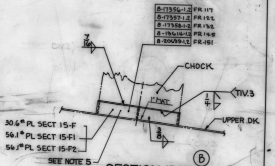
1806

DETAIL 15-A
PLAN VIEW - 20 ROLLER FAIRLEAD
FR-139 STBD
SCALE: 3/4 = 1'-0

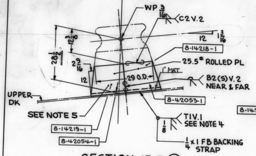

INBOARD
WP
15
D

1806

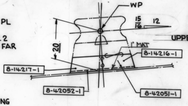
DETAIL 15-C
PLAN VIEW - 20 ROLLER FAIRLEAD
FR-142 STBD
SCALE: 3/4 = 1'-0


8-17356-1,2 FR 117
8-17357-1,2 FR 122
8-17358-1-2 FR 132
8-19614-1,2 FR 145
8-20699-1,2 FR-151
7/16
CHOCK
1" MAT
1/4
TIV.3
UPPER DK
3/8
30.6# PL SECT 15-F
56.1# PL SECT 15-F1
56.1# PL SECT 15-F2
SEE NOTE 5
Ⓑ

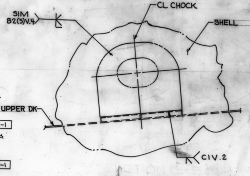
SECTION 15-F
SECTION 15-F1
SECTION 15-F2
SCALE: 3/4 = 1'-0


WP 3/16
C2V.2
12
1 3/16
12 3/8
28 1/2
8-14218-1
2 9/16
25.5# ROLLED PL
12
29 O.D.
1" MAT
B2(S)V.2
NEAR & FAR
UPPER DK
8-42053-1
SEE NOTE 5
TIV.1
SEE NOTE 4
1/8
8-14219-1
8-42054-1
1/4 x 1 FB BACKING STRAP

SECTION 15-B ©
SCALE: 3/4 = 1'-0


WP
15/16
12
20
1" MAT
8-14216-1
8-14217-1
8-42052-1
8-42051-1

SECTION 15-D ©
FOR INFO NOT SHOWN SEE SECT 15-B
SCALE: 3/4 = 1'-0


SIM
B2(S)V.4
CL CHOCK
SHELL
UPPER DK
C1V.2

SECTION 15-E
SCALE: 3/4 = 1'-0

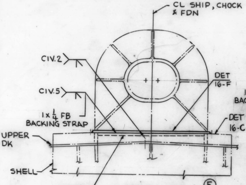
K&E 19 1253 7-74 W 2847 B•

HULL NO. 613C & 614C	DWG NO. 1203-52	REV. C
		SHEET 15

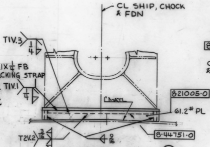
MN15-17X22 (REV. 1)

1203-52

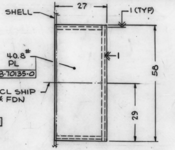
SEPT. '80
6X


CL SHIP, CHOCK & FDN
CIV.2
CIV.5
DET 16-F
1 x 1/4 FB BACKING STRAP
DET 16-C
UPPER DK
SHELL
8-44753-0

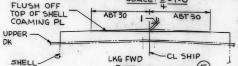
SECTION 16-D (F)
SCALE: 3/4 = 1'-0


CL SHIP, CHOCK & FDN
TIV.3
1/4
1 x 1/4 FB BACKING STRAP
TIV.1
1/4
8-21005-0
1" MATL
61.2# PL
T2V.2
3/16
9/16
8-44751-0

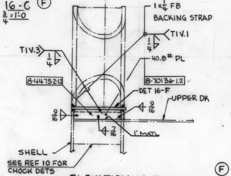
SECTION 16-E (F)
SCALE: 3/4 = 1'-0


SHELL
27
1 (TYP)
1
40.8# PL
8-70135-0
CL SHIP & FDN
58
29

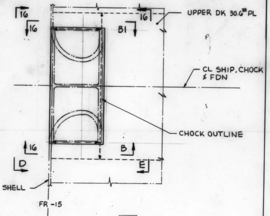
DETAIL 16-F (F)
SCALE: 3/4 = 1'-0


FLUSH OFF TOP OF SHELL COAMING PL
ABT 30
ABT 30
1
UPPER DK
SHELL
LKG FWD
CL SHIP

DETAIL 16-C (F)
SCALE: 3/4 = 1'-0


VERTICAL
1 x 1/4 FB BACKING STRAP
TIV.1
1/4
TIV.3
1/4
40.8# PL
8-44752-1,2
8-70136-1,2
DET 16-F
UPPER DK
9/16
9/16
7/16
1" MATL
SHELL
SEE REF 10 FOR CHOCK DETS

ELEVATION 16-B AS SHOWN (F)
ELEVATION 16-B1 SIM TO OPP HAND
SCALE: 3/4 = 1'-0


16
16
16
B1
UPPER DK 30.6# PL
CL SHIP, CHOCK & FDN
CHOCK OUTLINE
16
D
B
E
SHELL
FR -15

6493

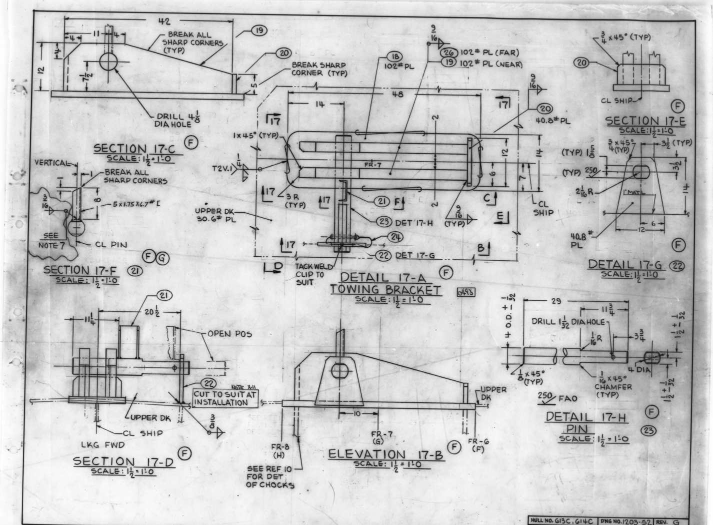
DETAIL 16-A (F)
PLAN VIEW OF CLOSED CHOCK
FR - 15
SCALE: 3/4 = 1'-0

HULL NO. 613C, 614C
DWG NO. 1203-52
REV. F
SHEET 16

1203-52

MICRO-MASTER 105 mm
K+E

SEPT. '80
6X


42
4
11
4
4
12
7 1/2
BREAK ALL SHARP CORNERS (TYP)
(19)
(20)
BREAK SHARP CORNER (TYP)
5
DRILL 4 1/8 DIA HOLE
SECTION 17-C (F)
SCALE: 1 1/2 = 1'-0
VERTICAL
1
1
BREAK ALL SHARP CORNERS
3/16
8
5 x 1.75 x 6.7# [
SEE NOTE 7
CL PIN
(F) (G)
SECTION 17-F (21)
SCALE: 1 1/2 = 1'-0
9/16
(18) 102# PL
(26) 102# PL (FAR)
(19) 102# PL (NEAR)
48
14
17
17
9/16
(20) 40.8# PL
1 x 45° (TYP)
T2V.1
1/4
2
12
14
6
7
FR-7
3 R (TYP)
17
17
(21)
F
C
CL SHIP
2
9/16 (TYP)
UPPER DK 30.6# PL
(23) DET 17-H
E
17
(24)
B
(22) DET 17-G
D
TACK WELD CLIP TO SUIT
DETAIL 17-A (F)
TOWING BRACKET
SCALE: 1 1/2 = 1'-0
0493
3/4 x 45° (TYP)
(20)
CL SHIP
(F)
SECTION 17-E
SCALE: 1 1/2 = 1'-0
(TYP) 1 5/8
3/4 x 45° (TYP)
3 1/2 (TYP)
(TYP) 250
3 1/2
2 1/16 R
MATL
14
6
12
40.8# PL
(F)
DETAIL 17-G (22)
SCALE: 1 1/2 = 1'-0
(21)
11 1/4
20 1/2
OPEN POS
(22)
NOTE X-11
CUT TO SUIT AT INSTALLATION
UPPER DK
CL SHIP
3/8
LKG FWD
SECTION 17-D (F)
SCALE: 1 1/2 = 1'-0
UPPER DK
10
FR-8 (H)
FR-7 (G)
FR-6 (F)
SEE REF 10 FOR DET OF CHOCKS
ELEVATION 17-B (F)
SCALE: 1 1/2 = 1'-0
4 O.D. + 0 − 1/32
29
11 3/4
DRILL 1 1/32 DIA HOLE
1/16 R
3 3/4
1 1/2 + 1/32 − 0
1/8 x 45° (TYP)
1/16 x 45° CHAMFER (TYP)
4 DIA
1 1/2 + 0 − 1/32
250 FAO
DETAIL 17-H (F)
PIN (23)
SCALE: 1 1/2 = 1'-0

HULL NO. 613C, 614C	DWG NO. 1203-52	REV. G
		SHEET 17

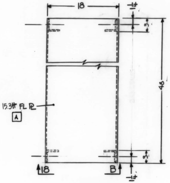
1203-52

MICRO-MASTER 105 mm

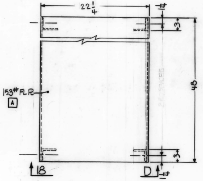
K+E

SEPT. '80

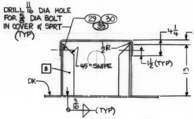
6X


18
1½
3
48
15.3# FL PL
A
18
B
3
1½

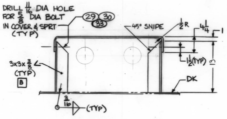
DETAIL 18-A Ⓗ ㉘
PIPE GUARD
SCALE: 1½ = 1'-0


22¼
1½
3
48
15.3# FL PL
A
18
D
3
1½

DETAIL 18-C Ⓗ
PIPE GUARD ㉜
SCALE: 1½ = 1'-0


DRILL 11/16 DIA HOLE
FOR 5/8 DIA BOLT
IN COVER & SPRT
(TYP)
㉙ ㉚ ㉝
4¼
1
½R
45° SNIPE
1½ (TYP)
13
B
DK
3/16 (TYP)

SECTION 18-B Ⓗ
SCALE: 1½ = 1'-0


DRILL 11/16 DIA HOLE
FOR 5/8 DIA BOLT
IN COVER & SPRT
(TYP)
㉙ ㉚ ㉝
45° SNIPE
½R
4¼
1
1½ (TYP)
13
3x3x3/8 L
(TYP)
B
DK
3/16 (TYP)

SECTION 18-D Ⓗ
SCALE: 1½ = 1'-0

HULL NO.	614C	DWG NO. 1203-52	REV. H
			SHEET 18

K&E 10 1253 7-74 W2847B

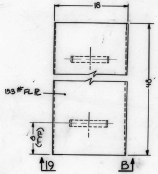
MN15-17X22 (REV. 1)

1203-52

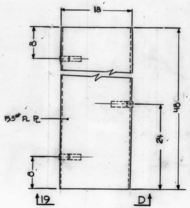
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

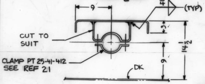
6X


18
153# FL PL
8 (TYP)
48
19
B

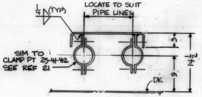
DETAIL 19-A Ⓗ
PIPE GUARD (27)
SCALE: 1½=1'-0


18
8
153# FL PL
48
24
8
19
D

DETAIL 19-C Ⓗ
PIPE GUARD (31)
SCALE: 1½=1'-0


9
¼
(TYP)
CUT TO SUIT
3
14½
CLAMP PT 25-41-412
SEE REF 21
9
DK

SECTION 19-B Ⓗ
SCALE: 1½=1'-0


¼
(TYP)
LOCATE TO SUIT
PIPE LINES
3
14½
SIM TO
CLAMP PT 25-41-412
SEE REF 21
9
DK

SECTION 19-D Ⓗ
SCALE: 1½=1'-0

HULL NO. 613C	DWG NO. 1203-52	REV. H
		SHEET 19

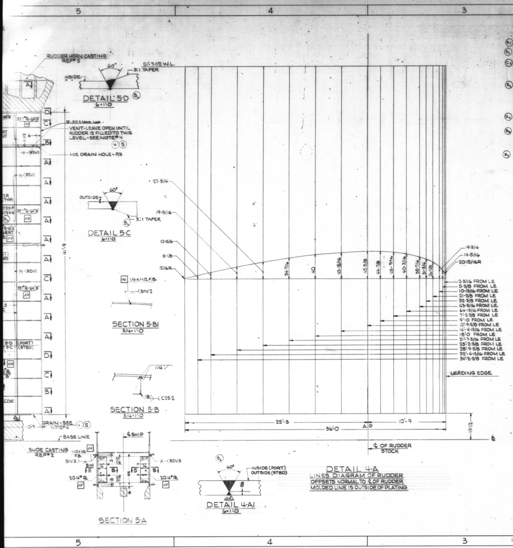
K&E 19 1233 7-74 W 2847 B

MN15-17X22 (REV. 1)

1203-52

SEPT. '80

6X


5
4
3
RUDDER HORN CASTING REF# 5
60°
51'-7-1/2 W.L.
3:1 TAPER
INSIDE
DETAIL 5-D
6"=1'-0
SF - FIT & LEAVE LOOSE
VENT~LEAVE OPEN UNTIL RUDDER IS FILLED TO THIS LEVEL~SEE NOTE# 4
④⑤
1-1/2 DRAIN HOLE~P/S
35.7# PL-GR'B'
102
103
101
107
104
B2V.1
2R (TYP)
(PORT)
(STBD)
41'-9
27-3/4
19-13/16
10-15/16
6-1/8
15/16R
OUTSIDE
60°
3:1 TAPER
DETAIL 5-C
6"=1'-0
116 1/4x1-1/2 F.B.
B1V.2
SECTION 5-B1
3/4"=1'-0
1/4
1/8
C25.2
SECTION 5-B
3/4"=1'-0
DRAIN~SEE NOTE#4 ④⑤
10'-9
BASE LINE
SHOE CASTING REF#2
℄ SHIP
1-1/2x1/4 F.B.
B1V.3
SIM
B2V.3
20.4# PL
115
SECTION 5-A
34-7/16
40
43-15/16
45-3/8
44-7/8
43-5/16
40-7/16
35-7/16
31-3/4
26-7/8
19-3/4
14-5/16
20-15/16R
2-3/16 FROM LE
5-3/8 FROM LE
10-13/16 FROM LE
21-5/8 FROM LE
32-3/8 FROM LE
43-3/16 FROM LE
64-13/16 FROM LE
7'-2-3/8 FROM LE
9'-0 FROM LE
10'-9-5/8 FROM LE
14'-4-13/16 FROM LE
18'-0 FROM LE
21'-7-3/16 FROM LE
25'-2-3/8 FROM LE
28'-9-5/8 FROM LE
32'-4-13/16 FROM LE
34'-2-3/8 FROM LE
LEADING EDGE
25'-3
10'-9
36'-0
A.P.
43-1/2
℄ OF RUDDER STOCK
60°
INSIDE (PORT)
OUTSIDE (STBD)
3/8
DETAIL 4-A1
6"=1'-0
DETAIL 4-A
LINES DIAGRAM OF RUDDER
OFFSETS NORMAL TO ℄ OF RUDDER
MOLDED LINE IS OUTSIDE OF PLATING

LIST OF MATERIAL

QUANTITIES ARE FOR ONE SHIP OR ONE ASSEMBLY

	NO PARTS REQ'D	NO SPARES REQ'D	ASSY NO / PART NO	NAME OF PART	MATERIAL	MAT'L SPECS	ZONE	REFERENCE PLAN NO	SHOCK GRADE	UNIT WT LBS	REMARKS
(B7)	1		1	TRAILING BAR (LOWER MIDDLE)	CAST STEEL	ASTM A-27-71 GRADE 60-30	7-B	THIS PLAN			
	1		2	TRAILING BAR (UPPER MIDDLE)	CAST STEEL	ASTM A-27-71 GRADE 60-30	7-C				
(B2)	2		3	CAP PL	CRES 316	AISI-316	8-A 10-B	REF# 13			
	~~5~~		4	BLEEDER	ABS STEEL			THIS PLAN			ORD ON REF#12
(C2)	~~5~~		5	1-1/2 IPS PIPE PLUG	NI CU						ORD ON REF#12
	2		6	PINTLE	FORGED STEEL	ABS HULL GRADE 2	7-C 11-B	REF# 13			
	8		7	LOCKING PLATE	ABS STEEL		8-A1				
	2		8	PINTLE NUT	FORGED STEEL	ABS HULL GRADE 2	7-D				
(B2)	2		9	PINTLE SLEEVE	CRES 316	AISI - 316	9-D				
	78		10	STAVES	MICARTA						
	1		11	25.5# ROLLED PL	ABS STEEL		8-B				
	2		12	1/2 IPS STD PIPE PLUG-SQ HD	BRONZE		9-A				
	2		13	LIFTING EYE (2-DIA SHOULDER PATTERN)	FORGED STEEL		8-C 10-D				PART N° [illegible] WILLIAMS CHAIN BOT
	2		14	2 STD HEX HD BOLT L=4	ABS STEEL		8-C 10-D				4-1/2-UNC-2A
(B4)	1		15	25.5# PLT	ABS STEEL		8-C				
	2		16	RETAINING RING	ABS STEEL		7-C				
	2		17	20.4# PL	ABS STEEL		7-D				
(B6)	4		18	3/4 DIA HEX HD TAP BOLT L=1-3/8	ABS STEEL		8-A				10 UNC-2A
	1		19	30.6# PL	ABS STEEL		8-A2 9-A1				
	1		20	30.6# PL	ABS STEEL		[illegible]				
	1		21	TRAILING BAR (LOWER)	CAST STEEL	ASTM A-27-71 GRADE 60-30	7-B	THIS PLAN			
(B7)	1		22	TRAILING BAR (TOP)	CAST STEEL	ASTM A-27-71 GRADE 60-30	7-D				

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	AUTH'D	OWNER DATE	APP'D
A		INITIAL ISSUE TO YD R.D. RFC				
B	8A, 7A, 8A1, 9A1, 10A1, 11A	1. DET 6-A: ALL SKIN PLTG OF RUDDER ALT TO GR'B' IN LIEU OF GR'A'. SECT 7-A, 8-A, 8-A1, 9-A, 9-A1, 10-A, 10-A1, 11-A ALL VERTICAL WEB PLTG ALT TO GR'B' IN LIEU OF GR'A'. DESIGN DEVELOPMENT.				
	3D2	2. IN L/M MTL SPECS ADDED FOR ITEM# 8&9				
	1C	3. GEN NOTE #10&11 ADDED FOR CLARIFICATION.				
	10C, 11C, 10D	4. SECT 10-A1 & 11-A: BUTT ADDED 8" ABV 2ND WEB FROM TOP IN LINE WITH BUTT IN PLTG. SECT 10-A: BUTT ADDED IN 6x4x1/2 L 9" ABV TOP WEB. ALL TO FACILITATE FABRICATION & ERECTION.				
	3D	5. IN L/M QUANTITY OF ITEM# 15 ALT TO 1 IN LIEU OF 2. DET 6-A WELD ADDED FOR INSERT PLT IWO LIFTING PAD. PLAN CORRECTION.				
	5D, 5C, 4A	6. DET 5-D, 5-C & 4-A1 ALT TO REFLECT CHANGES AS PER OWNERS PRINT & LETTER (ZAPATA) DTD 5-24-6 & ABS.				
	7C, 7B, 1D, 1C	7. DET 6-A: BUTTS ADDED IN TRAILING EDGE CASTING BOT & TOP HALVES TO FACILITATE FABRICATION. IN L/M ITEM# 1&2 ALT & ITEM# 21&22 ADDED TO SUIT.				
	3D	8. IN L/M ITEM# 17, 18, 19 & 20 ALL TO SUIT REV'B' OF REF# 13.				
	3D3	9. DET 8-A, 8-A1 & 9-A: WELD TO SIDE PLTS ALT TO 7/16 IN LIEU OF 5/16. DESIGN DEVELOPMENT R.D. RFC				
C	1C	1. NOTE #11 REVISED FOR PLAN CLARIFICATION.				
	3D	2. IN L/M ITEM# 5 (MATERIAL) ALT TO NI CU TO SUIT REF# 15. PLAN CORRECTION. R.D. RFC				
D	6A	1. DET 6-A: 9 DIM ADDED FOR TRAILING BAR OF CASTING. PLAN CLARIFICATION. WORK ACCOMPLISHED BY MOLD LOFT DURING ISSUE OF REV C.				
	1D	2. GENERAL NOTE #6: INDICATED REF. ALT FROM #11 TO #13. PLAN CORRECTION. RTW			7-14-77	ZAPATA
E	6C	1. DET 6-A: 15x23 TEMP. OPNG ADDED 6'-6 AFT OF A.P. & 25'-11 ABV ℄ TO PROVIDE ACCESS FOR PAINTING.				
	6A, 6D, 7A, 7D	2. DET 6-A: INDICATION OF BACKING BARS DELETED TOP & BOT OF RUDDER BETWEEN CASTING & 20'-6 AFT OF A.P. SECT 7-A: INDICATION OF BACKING BARS ADDED AT TOP & BOT OF RUDDER. ALL TO SUIT DEVELOPMENT OF REF #13. NSP CAH				
F	7C	DET 6-A: STBD SIDE; WELD ALT AT ERECTION BREAK ADJACENT TO TRAILING EDGE. SECT 7-A: WELD ALT AT ERECTION BREAK. ALL AT YARD REQUEST TO FACILITATE FABRICATION. THIS INCORPORATES LIAISON MEM 152 DTD 3-27-78.				

AUTHORITY:

GENERAL NOTES:

1. FOR GENERAL NOTES PERTAINING TO STRUCTURAL PLANS SEE REF# 1.
2. OFFSETS ARE TO OUTSIDE OF PLATING~OUTSIDE SURFACE OF RUDDER TO BE FLUSH
3. BEARING STAVES TO BE ORDERED TO CONFORM TO BUSHIPS DRAWING N° 52200-921759 AND 52200-921760 REF# 9 & 10.
4. RUDDER TO BE W.T. & TO BE AIR TESTED TO SUIT REF# 16. AFTER AIR TEST IS COMPLETED INTERIOR TO BE COATED BY FILLING & DRAINING WITH RUST PREVENTIVE COMPOUND TO SUIT REF# 7 & 14.
5. DESIGN BASED ON A SPEED OF 16 KNOTS.
6. FOR HORIZONTAL SECTIONS & PINTLE DETAILS SEE REF# 13. (D2)
7. ALL WELDING SURFACES TO BE THOROUGHLY CLEANED BEFORE WELDING.
8. WEIGHT OF THE RUDDER, FINISHED COMPLETE EXCLUSIVE OF PINTLE ASSEMBLY & INTERIOR COATING IS ABT 560,000#
9. RUDDER TO BE BUILT WITH STBD SIDE UP.
10. PRE HEAT LOCALLY TO A MINIMUM OF 150° FOR LOW HYDROGEN ELECTRODES.
11. RUDDER TO BE STRESS RELIEVED AT A TEMPERATURE OF 1150°. STRESS RELIEVING IS TO BE DONE IN SEPARATE HALVES (TOP & BOTTOM) AFTER ALL WELDING IS COMPLETED AND BEFORE FINAL MACHINING IS DONE.

(C1)

NO.	REFERENCES	DWG NO.
16	LIST OF BHD & TK TEST INFO	1430-68
15	BLEEDER PLUGS	2500-2312
14	PAINTING SCHEDULE	8300-41
13	RUDDER SECTIONS	1310-71
12	BLEEDER PLUGS	2500-2288
11	STRUCTURAL DETAILS	0100-750
10	LAMINATED PHENOLIC STAVE TYPE RUDDER BEARING~TABLE OF DIMENSIONS	BUSHIP N° S-2200-921760
9	LAMINATED PHENOLIC STAVE TYPE RUDDER BEARING~ARR & STAVE DET	BUSHIP N° S-2200-921759
8	N.N. WELDING PROCEDURE	W-302
7	PAINTING SCHEDULE	8300-40
6	RUDDER STOCK	1310-72
5	RUDDER HORN CASTING	1200-41
4	RUDDER CASTING~UPPER	1310-85
3	RUDDER CASTING~LOWER	1310-86
2	SHOE CASTING	1200-33
1	GENL NOTES PERTAINING TO HULL STR	0100-749

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS	5/12/6 (SHELL) 5/24/6 (ZAPATA)	ABS	6/16/76 "C" 4-5-77
		USCG	6/28/76

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689

SCALE 3/8 & AS NOTED = 1 FT
DRAWN E.R. DICK JR.
CHECKED R.F. CARMINE
SECT MGR MC Moore 4/8/76
DATE COMPL 4-9-76
EXAMINED
AUTHORIZED
DATE 4-9-76
TECH APPROVAL C.J.G.
A. Conley
CSD APPROVAL E.E.S. for R.L. HARRINGTON

390,000 DWT TANKER

RUDDER ELEVATIONS

USMA DESIGN T11-S-116a
USMA DWG NO. HULL NO.
DWG NO. 1310-70
REV F
SHEET NO. 1 OF 1

FABRICATION NOTES
REV. F ADDED 4-21-78

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING YES
REMARKS REV F
DATE 4-4-78 SIGNED MC Moore

GROUP: MC NO.

HT	DH	YD
105	113	130

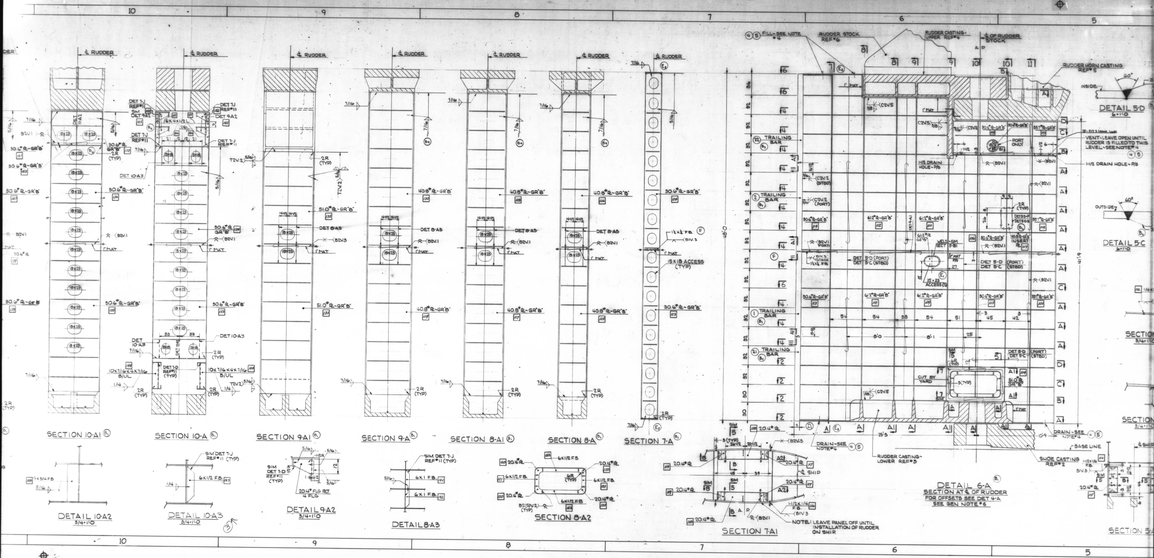
For Hull 613C, 614C, 615C Date 4-30-76
By Fogg Sect. Mgr. W.T. DICKINSON

1310-0406-1: MFG. ORDER FOR RUDDER & FINAL MACHINING OF UPPER RUDDER CASTING
1310-0406-1002: RUDDER INSTALLATION GROUP

Fogg
NOS. USED 101 THRU 151

1310-70

1310-70
MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
10X
FRAME 1


10
9
8
7
6
5
℄ RUDDER
SECTION 10-A1 (B1)
SECTION 10-A (B1)
SECTION 9-A1 (B1)
SECTION 9-A (B1)
SECTION 8-A1 (B1)
SECTION 8-A (B1)
SECTION 7-A (B1)
DETAIL 10-A2
3/4=1-0
DETAIL 10-A3
3/4=1-0
DETAIL 9-A2
3/4=1-0
DETAIL 8-A3
SECTION 8-A2
SECTION 7-A1
DETAIL 6-A (B1)
SECTION AT ℄ OF RUDDER
FOR OFFSETS SEE DET 4-A
SEE GEN NOTE #6
DETAIL 5-D
6=1-0
DETAIL 5-C
6=1-0
RUDDER STOCK REF#6
RUDDER CASTING-UPPER REF#4
℄ OF RUDDER STOCK
RUDDER HORN CASTING REF#5
FILL-SEE NOTE #4
VENT-LEAVE OPEN UNTIL RUDDER IS FILLED TO THIS LEVEL-SEE NOTE #4
1-1/2 DRAIN HOLE-P/S
TRAILING BAR
15×18 ACCESS (TYP)
RUDDER CASTING-LOWER REF#3
SHOE CASTING REF#2
BASE LINE
DRAIN-SEE NOTE #4
CUT BY YARD
NOTE: LEAVE PANEL OFF UNTIL INSTALLATION OF RUDDER ON SHIP
30.6# ℞-GR'B'
40.8# ℞-GR'B'
51.0# ℞-GR'B'
61.2# ℞-GR'B'
20.4# ℞
6×1/2 F.B.
48'-0
SECTION 5-A

1310-70

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 2

10X

FABRICATION NOTES
REV. F ADDED. 4-21-78

THE NOTES BELOW AND THE ONES MARKED Ø ARE FOR NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY USE FOR FABRICATION AND ERECTION PURPOSES ONLY. THEIR ADDITION TO THIS PLAN IS NOT MADE UNDER THE SUPERVISION OF THE HULL DESIGN DIVISION. THUS, THEY CAN IN NO WAY BE CONSTRUED AS AFFECTING OR MODIFYING THE DESIGN DEPICTED HEREIN OR ANY NON-DEVIATIONAL REQUIREMENTS.

613C - 615C
DWG. 1310-70 REV. "A", B, C, D, E, F

1. X-14 MOLD LOFT △B △D △E △F

   A. FURNISH MOLDS AND/OR TAPES TO X-15 FAB SHOP FOR ALL STRUCTURE.
   B. LEAVE ADDED MATERIAL AS MARKED IN BODY OF DRAWING AND ESTABLISH DESIGN CUT LINES INO ADDED MATERIAL, PUNCH MARK SAME..

2. X-15 FAB. SHOP △B △E △F

   A. FABRICATE ALL MATERIAL AS PER MOLDS AND/OR TAPES.

3. M-50 DIVISION

   A. FURNISH PART # 5 & 12 TO X-12 SHOPFITTERS.

4. X-12 SHOPFITTERS △B △C △F

   A. FINAL ASSEMBLY.
      1. ERECT UPPER AND LOWER FUDDER CASTINGS, MAKE UP TO RUDDER PLATING.
      2. LAY PORT SIDE OF RUDDER PLATING DOWN.
      3. ERECT ALL INTERNAL STRUCTURE.
      4. INSTALL TRAILING BAR, PART # 1 AND 2.
      5. INSTALL BLEEDERS AND PIPE PLUGS, PART # 4, 5 AND 12.
      6. WRAP STBD SIDE RUDDER PLATING ON TO UNIT.
      7. LEAVE ACCESS OPENINGS LOOSE AT TOP + BOTTOM of RUDDER.
      8. BREAK RUDDER ASSEMBLY AT ABT 23'-5 ABOVE BOTTOM OF RUDDER AND SEND TO HAVE STRESS RELIEVED.
      9. AFTER STRESS RELIEF IS ACCOMPLISHED, SEND TO M50 DEVISION.

5. M-50 DIVISION △C

   A. MACHINE RUDDER AS PER DRAWING. SEND TO X-11 SHIPFITTERS. (NOTE: LOWER RUDDER BORE FOR RUDDER STOCK TO BE MACHINED ON SHIP)

6. X-11 SHIPFITTERS △C △F

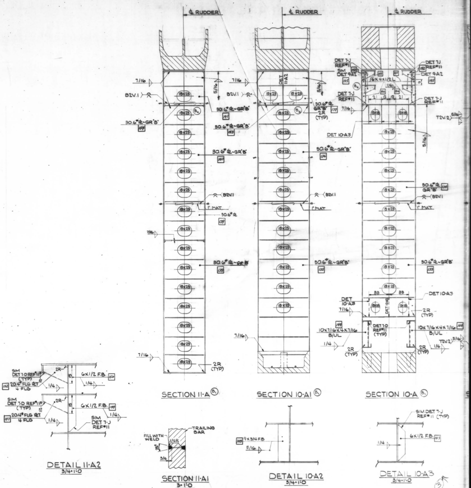
   A. JOIN UPPER AND LOWER PORTIONS OF RUDDER ASSEMBLY, MAKE UP, HAVE WELDED
   B. HAVE AIR TESTED TO SUIT DWG. 1430-68.
   C. HAVE BLASTED AND COAT INTERIOR TO SUIT GENERAL NOTE # 4 AND DWG. 8300-40 AND 8300-41.

7. MACHINERY INSTALLATION

   A. INSTALL RUDDER ASSEMBLY IN PLACE ON SHIP.
   B. MACHINE BORE FOR RUDDER STOCK IN LOWER CASTING IN PLACE ON SHIP.

8. PATTERNMAKERS & FOUNDRY △B

   A. FURNISH CASTINGS - PARTS #1, 2, 21 & 22.


13
12
11
10
℄ RUDDER
℄ RUDDER
℄ RUDDER
7/16
5/16
B2V.1
18x25
30.6# ℞-GR'B'
1" MAT
2R (TYP)
DET 11-A2
DET 7-J REF#11
SIM DET 9A2
6x4x1/2 L
DET 9A2
DET 10-A3
T2V.2
38
10x7/16x4x7/16 B/UL
DET 7-D REF#11 (TYP)
1/4
SIM DET 7-D REF#11 (TYP)
20.4# FLG ℞T 4 FLG
6x1/2 F.B.
SIM DET 7-J REF#11
FILL WITH WELD
TRAILING BAR
9x3/4 F.B.
SIM DET 7-J REF#11 (TYP)

SECTION 11-A (B)

SECTION 10-A1 (B)

SECTION 10-A (B)

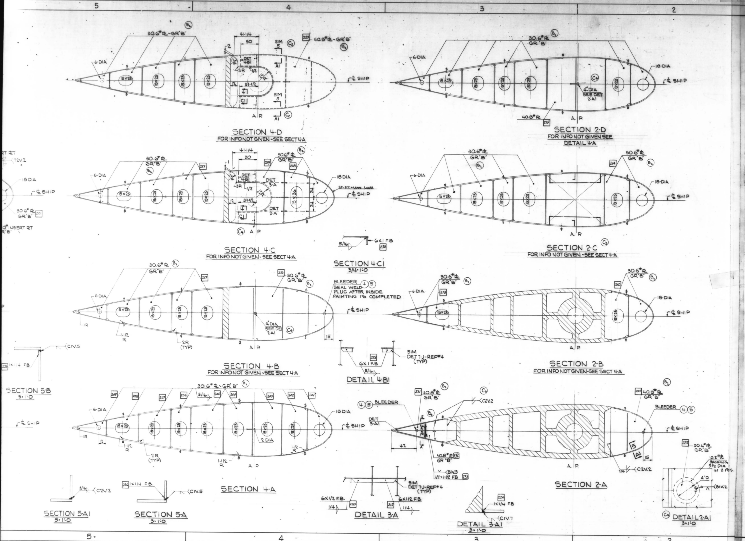
DETAIL 11-A2
3/4"=1'-0

SECTION 11-A1
3"=1'-0

DETAIL 10-A2
3/4"=1'-0

DETAIL 10-A3
3/4"=1'-0

1310 - 70
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
10X
FRAME 3


SECTION 4-D
FOR INFO NOT GIVEN - SEE SECT 4-A
SECTION 2-D
FOR INFO NOT GIVEN SEE DETAIL 4-A
SECTION 4-C
FOR INFO NOT GIVEN - SEE SECT 4-A
SECTION 2-C
FOR INFO NOT GIVEN - SEE SECT 4-A
SECTION 4-C1
3/4-1'-0
SECTION 4-B
FOR INFO NOT GIVEN - SEE SECT 4-A
DETAIL 4-B1
SECTION 2-B
FOR INFO NOT GIVEN - SEE SECT 4-A
SECTION 5-B
3-1'-0
SECTION 4-A
SECTION 2-A
SECTION 5-A1
3-1'-0
SECTION 5-A
3-1'-0
DETAIL 3-A
DETAIL 3-A1
3-1'-0
DETAIL 2-A1
3-1'-0
30.6# ℞ - GR "B"
40.8# ℞ - GR "B"
6-DIA
18 DIA
℄ SHIP
A.P.
15×23
18×23
4" DIA SEE DET 2-A1
BLEEDER
SEAL WELD - PLUG AFTER INSIDE PAINTING IS COMPLETED
6×1 F.B.
6×1/2 F.B.
1×1/4 F.B.
SIM DET 7-J - REF#4 (TYP)
2R (TYP)
10.2# ℞ BACKING 5 1/2 DIA IN 2 PCS.

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH	OWNER DATE	OWNER APPD
A		INITIAL ISSUE TO YD	R.D. RFC			
B		1. DET 10-B: NOTE ADDED IWO PINTLE RECESS TO FILL WITH RED LEAD PUTTY. DET 8-A & 10-B CAP ℞ ITEM #17 ALT TO ITEM #3. PLAN CORRECTION				
		2. SECT 2-A, 2-B, 2-C, 2-D, 4-A, 4-B, 4-C, 4-D, 6-A, 6-B & 6-C: ALL HORIZONTAL WEBS ALT TO GR "B". DESIGN DEVELOPMENT.				
		3. SECT 2-A & 6-B: INDICATION OF SECT 5-A & 5-B ADDED PORT SIDE. DET 7-C: INSIDE DIA OF RETAINING RING ALT TO 28 DIA IN LIEU OF 32-1/4 DIA & INTERMITTEN WELD DELETED & CONTINIOUS WELD INDICATED IN DET 8-A & 10-B. DET 7-D LOCKING ℞T (ITEM #17) ADDED & INDICATED IN DET 8-A & 10-B (ITEM #18) ADDED. DET 8-A2, 10-A, SECT 9-A & 11-A (ITEM # 19 & 20) RESP ADDED. SECT 8-B ALT. ALL TO SUIT OWNERS (SHELL) PRINT & LETTER DTD 5-12-76.				
	8A	4. DET 8-A1: RADIUS CUT OUT ADDED TO SUIT OWNERS (ZAPATA) PRINT & LETTER DTD 5-24-76.	R.D. RFC			
C	7C	1. DET 8-A: FOR LOCKING PAD AT TOP OF PINTLE SEE DET 8-A2 IN LIEU OF DET 8-A1. PLAN CORRECTION.				
	4D	2. SECT 4-D: WELD ADDED FOR RUDDER TOP PLATE.				
		3. SECT 2-A & 6-B: BUTT ADDED IN FRTG AFT OF CASTING & WELD OF FWD SECTIONS OF SAME ALT. ALL TO FACILITATE ASSEMBLY.				
	2A 2D 4B	4. DET 2-A1, SECT 2-D & 4-B: FILL & DRAIN HOLE INCREASED FROM 2" TO 4" DIA & WELD ALTERED TO FACILITATE ASSEMBLY	NSP CAH			
D	8B	1. DET 8-A: NOTE "COAT W/ RUST PREVENTIVE IWO STAVES (MIL-C-16173 GR 1 OR EQ.)" ADDED. DESIGN DEVELOPMENT. WORK ACCOMP ON 613C.				
		2. APPLICABILITY TO 615C DELETED.				
	7D²	3. DET 7-D: NOTE "DRILL & TAP 2 HOLES FOR 3/4 DIA. BOLTS (LOWER PINTLE ONLY)" ADDED. NOTE "DRILL 3/4 DIA HOLE" ADDED 6" FROM TOP OF NUT FOR UPPER & LOWER PINTLE NUT. ALL AT YARD REQUEST. THIS INCORP LIAISON # MEM-452 OF 9-5-78.	KRM			

C.O.D. 10-12-77

AUTHORITY:

GENERAL NOTES:

1. FOR GENERAL NOTES PERTAINING TO STRUCTURAL PLANS SEE REF #1.
2. FOR GENERAL NOTES SEE REF #3.
3. FOR BILL OF MATERIAL SEE REF #3.

NO.	REFERENCES	DWG NO.
9		
8	SHOE CASTING	1200-33
7	RUDDER HORN CASTING	1200-41
6	RUDDER CASTING ~ LOWER	1310-86
5	RUDDER CASTING ~ UPPER	1310-85
4	STRUCTURAL DETAILS	0100-750
3	RUDDER ELEVATIONS	1310-70
2	N.N. WELDING PROCEDURE	W-302
1	GENL NOTES PERTAINING TO HULL STR	0100-749

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
~~615C~~	~~311~~	
614C	310	
613C	309	

APPROVALS

OWNERS (SHELL) 5-12-76 (ZAPATA) 5-24-76
ABS 6-26-6
USCG 6-28-76

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP DESIGN DEPT

SCALE 3/8 & AS NOTED = 1 FT
DRAWN F.R. DICK JR.
CHECKED R.F. CARMINE
SECT MGR MC Mason 4/8/76
DATE COMPL. 4-9-76
EXAMINED
AUTHORIZED
DATE 4-9-76
TECH APPROVAL C.J.G.
C.S.D. APPROVAL for R.L. Harrington

390,000 DWT TANKER

RUDDER SECTIONS

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO.
DWG NO. 1310-71
REV D
SHEET NO. 1 OF 1

1310-71

GROUP:
MC NO.

HT	DH	YD
108	113	130

For Hull 613C 614C 615C Date 4-30-76
By
Sect. Mgr. W. T. Dickinson

1310-0406-1: MFG. ORDER FOR RUDDER & FINAL MACHINING OF UPPER RUDDER CASTING

1310-0406-1002: RUDDER INSTALLATION GROUP

Ⓒ C.O.D. USED 232-235

Figg NOS. USED 201 THRU 231

FABRICATION NOTES
REV D ADDED 9-21-78

1310 - 71

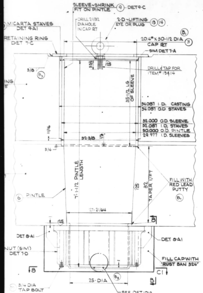
MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

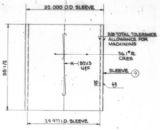
SEPT. '80

10X

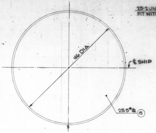
FRAME 1


SLEEVE-SHRINK FIT ON PINTLE (9) DET 9-C
MICARTA STAVES DET 9-A1
DRILL 2-1/32 DIA HOLE IN CAP RT
2-D-LIFTING EYE OR PLUG (13)(14)
RETAINING RING DET 7-C
20.4#x30-1/2 DIA CAP RT (3)
SIM DET 7-A
DRILL & TAP FOR ITEM# 13 & 14
35-1/2 LG OF SLEEVE
34.087 I.D. CASTING
34.087 O.D. STAVES
32.000 O.D. SLEEVE
32.087 I.D. STAVES
30.000 O.D. PINTLE
29.977 I.D. SLEEVES
32-3/8
7'-1-1/2 PINTLE LENGTH
32 TAPER 1/FT
FILL WITH RED LEAD PUTTY
(6) PINTLE
27-21/64
DET 8-A1
NUT (SIM) DET 7-D
FILL CAP WITH "RUST BAN 324"
25-DIA
3/4 DIA TAP BOLT
SEE DET 10-A
C1

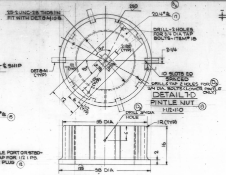
DETAIL 10-B
PINTLE DETAIL
SECT ON ℄ ~LKG TO PORT
1-1/2=1-0


32.000 O.D. SLEEVE
3/8 TOTAL TOLERANCE ALLOWANCE FOR MACHINING
35-1/2
56.1# R CRES
B2V.3 N&F
SLEEVE (9)
29.977 I.D. SLEEVE

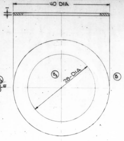
DETAIL 9-C
1-1/2=1-0


46 DIA
℄ SHIP
25.5# R (15)

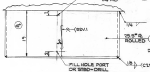
SECTION 8-C1
1-1/2=1-0


25-2 UNC-2B THDS/IN FIT WITH DET 8-A2 10-B
250
20.4# R (17)
DRILL-2 HOLES FOR 3/4 DIA TAP BOLTS~ITEM# 18
2-1/4
DET 8-A1 (TYP)
10 SLOTS EQ SPACED
DRILL & TAP 2 HOLES FOR 3/4 DIA. BOLTS (LOWER PINTLE ONLY)
DRILL 3/4 DIA HOLE
35 DIA
1R (TYP)
16
38 DIA

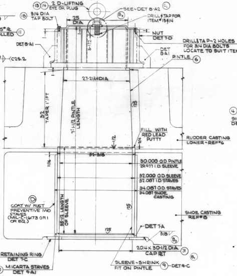
DETAIL 7-D
PINTLE NUT
1-1/2=1-0 (8)


40 DIA
28 DIA
(8)

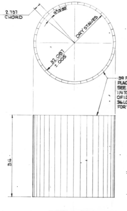
DETAIL 7-C
RETAINING RING (16)
1-1/2=1-0


VENT HOLE PORT OR STBD~DRILL & TAP FOR 1/2 I.P.S. STD PIPE PLUG SQ HD (12)
1/4
B2V.1
25.5# R ROLLED (11)
19
FILL HOLE PORT OR STBD~DRILL & TAP FOR 1/2 I.P.S. STD PIPE PLUG SQ HD (12)
1/8
C2S.2

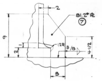
SECTION 8-B
1-1/2=1-0


(13)(14) 2-D-LIFTING EYE OR PLUG
SEE~DET 8-A2
(18) 3/4 DIA TAP BOLT
25 DIA
DRILL & TAP FOR ITEM# 13 & 14
NUT DET 7-D
DRILL & TAP~2 HOLES (18) FOR 3/4 DIA BOLTS LOCATE TO SUIT ITEM# 17
DET 8-A1
PINTLE (6)
27-21/64 DIA
32 TAPER 1/FT
7'-1-1/2 PINTLE LENGTH
FILL WITH RED LEAD PUTTY
RUDDER CASTING LOWER~REF#6
32-3/8
30.000 O.D. PINTLE
29.977 I.D. SLEEVE
32.087 I.D. STAVES
32.000 O.D. SLEEVE
34.087 O.D. STAVES
34.087 SHOE CASTING
COAT W/ RUST PREVENTIVE TWO STAVES (MIL-C-16173 GR 1 OR EQ.)
35-1/2 LENGTH OF SLEEVE
SHOE CASTING REF#8
DET 7-A
20.4#x30-1/2 DIA CAP RT (3)
(16) RETAINING RING DET 7-C
(10) MICARTA STAVES DET 9-A1
SLEEVE~SHRINK FIT ON PINTLE (9) DET 9-C

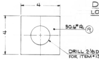
DETAIL 8-A
PINTLE DETAIL
SECT ON ℄ ~LKG TO PORT
1-1/2=1-0


2.737 CHORD
DRY STAVES
32.087 ±.005
39 FITTED IN STAVES WEDGED IN PLACE & BORED OUT TO 32.087 SEE NOTE 3~REF#3 1/4 TO BE ADDED TO THICKNESS OF I.D. FOR MACH. 2 STAVES TO BE 36 LONG & SPLIT BY YARD FOR WEDGE STAVES
34

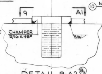
DETAIL 9-A1
MICARTA STAVES (10)
1-1/2=1-0


2
81.2# R (7)
9
2R
3/8
4-1/2
3

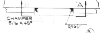
DETAIL 8-A1
LOCKING PLATE
3=1-0


4
30.6# R (19)
DRILL 2-1/8 D HOLE FOR ITEM# 13 & 14

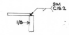
SECTION 9-A1
6=1-0


9
A1
CHAMFER 5/16 X 45°
5/16

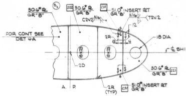
DETAIL 8-A2
6=1-0


11
A
CHAMFER 5/16 X 45°
5/16

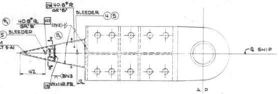
DETAIL 10-A
6=1-0



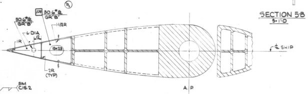
DETAIL 7-A
3=1-0


30.6# R GR"B"
30.6# R GR"B"
51.0# INSERT RT GR"B"
T2V.2
C2V.2
FOR CONT SEE DET 4-A
2R
18 DIA
℄ SHIP
2D
30.6# R GR"B"
2R (TYP)
51.0# INSERT RT GR"B"
A.P.

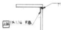
SECTION 6-C
FOR INFO NOT GIVEN~SEE SECT 4-A


40.8# R GR"B"
BLEEDER (4)(5)
40.8# R GR"B"
(4)(5) BLEEDER
SIM DET 5-A1
C2V.2
℄ SHIP
42
B1V.3
1/4 x 1-1/2 FB
A.P.

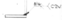
SECTION 6-B


30.6# R GR"B"
30.6# R GR"B"
1-1/2R
6-DIA
1R
12
2R (TYP)
℄ SHIP
A.P.

SECTION 6-A
FOR INFO NOT GIVEN~SEE SECT 4-A


C1V.5
1 x 1/4 FB

SECTION 5-B
3=1-0



SECTION 5-A1
3=1-0

6-DIA
6-DIA
6-DIA
6-DIA
1R
R

1310 - 71

MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA • ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 2

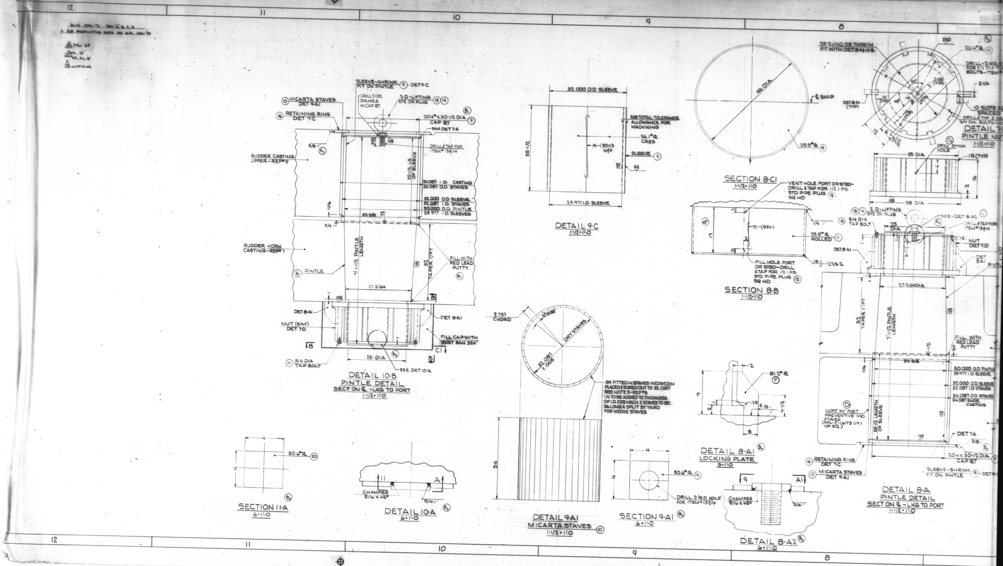
DWG 1310-71 REV "A", B, C, D

1- FOR FABRICATION NOTES SEE DWG. 1310-70

B ML-SF

C 6/13, SF
6/4, ML-SF

D OUTFITTING



DETAIL 10-B
PINTLE DETAIL
SECT ON ℄ ~ LKG TO PORT
1-1/2 = 1'-0

DETAIL 9-C
1-1/2 = 1'-0

SECTION 8-C1
1-1/2 = 1'-0

SECTION 8-B
1-1/2 = 1'-0

DETAIL 7-D
PINTLE NUT
1-1/2 = 1'-0

SECTION 11-A
6 = 1'-0

DETAIL 10-A
6 = 1'-0

DETAIL 9-A1
MICARTA STAVES ⑩
1-1/2 = 1'-0

SECTION 9-A1
6 = 1'-0

DETAIL 8-A1
LOCKING PLATE
3 = 1'-0

DETAIL 8-A2
6 = 1'-0

DETAIL 8-A
PINTLE DETAIL
SECT ON ℄ ~ LKG TO PORT
1-1/2 = 1'-0

12
11
10
9
8
SLEEVE~SHRINK FIT ON PINTLE ⑨ - DET 9-C
⑩ MICARTA STAVES DET 9-A1
DRILL 2-1/32 DIA HOLE IN CAP PLT
2-D~LIFTING EYE OR PLUG ⑬ ⑭
⑯ RETAINING RING DET 7-C
20.4# x 30-1/2 DIA CAP PLT ③
SIM DET 7-A
3/8
DRILL & TAP FOR ITEM # 13 & 14
RUDDER CASTING UPPER ~ REF #5
35-1/2 LG OF SLEEVE
34.087 I.D. CASTING
34.087 O.D. STAVES
32.000 O.D. SLEEVE
32.087 I.D. STAVES
30.000 O.D. PINTLE
29.977 I.D. SLEEVES
11/16
32-3/8
1/2
3/4
RUDDER HORN CASTING ~ REF #7
⑥ PINTLE
7'-1-1/2 PINTLE LENGTH
32 TAPER 1"/FT
FILL WITH RED LEAD PUTTY
27-21/64
125
DET 8-A1
NUT (SIM) DET 7-D
FILL CAP WITH "RUST BAN 324"
C1
B
8
25-DIA
⑱ 3/4 DIA TAP BOLT
SEE DET 10-A
32.000 O.D SLEEVE
3/8 TOTAL TOLERANCE ALLOWANCE FOR MACHINING
56.1# PL CRES
X (B2V.3 N&F
SLEEVE ⑨
35-1/2
63
29.977 I.D. SLEEVE
46 DIA
℄ SHIP
25.5# PL ⑮
VENT HOLE PORT OR STBD~ DRILL & TAP FOR 1/2 I.P.S. STD PIPE PLUG SQ HD ⑫
(B2V.1
19
1/4
25.5# PL ROLLED ⑪
1/8 (C25.2
FILL HOLE PORT OR STBD~DRILL & TAP FOR 1/2 I.P.S. STD PIPE PLUG SQ HD ⑫
25-2 UNC-2B THDS/IN FIT WITH DET 8-A & 10-B
250
20.4# PL ⑰
DRILL~2 HOLES FOR 3/4 DIA TAP BOLTS~ITEM
2-1/4
DET 8-A1 (TYP)
90°
45°
2-1/32 (TYP)
1-1/2 (TYP)
12
6
10 SLOTS EQ SPACED
DRILL & TAP 2 HOL 3/4 DIA. BOLTS
DRILL 3/4 DIA HOLE
35 DIA
1R (TYP)
16
38 DIA
SEE~DET 8-A2
DRILL & TAP FOR ITEM # 13 & 14
NUT DET 7-D
27-21/64 DIA
3-1/2
2.737 CHORD
9°13'30"
DRY STAVES
32.087 ±.005
39 FITTED IN STAVES WEDGED IN PLACE & BORED OUT TO 32.087 SEE NOTE 3~REF #3 1/4 TO BE ADDED TO THICKNESS OF I.D. FOR MACH. 2 STAVES TO BE 36 LONG & SPLIT BY YARD FOR WEDGE STAVES
34
4
30.6# PL ⑳
30.6# PL ⑲
DRILL 2-1/8 D HOLE FOR ITEM # 13 & 14
CHAMFER 5/16 x 45°
5/16
81.2# PL ⑦
1/2R
3/8
4-1/2
3
COAT W/ RUST PREVENTIVE 1WO STAVES (MIL-C-16173 GR 1 OR EQ.)
35-1/2 LENGTH OF SLEEVE
34.087 SHOE CASTING
DET 7-A
2.0.4 x 30-1/2 DIA CAP PLT ③
A1

1310 - 71

MICRO-MASTER® 105 mm

K+E

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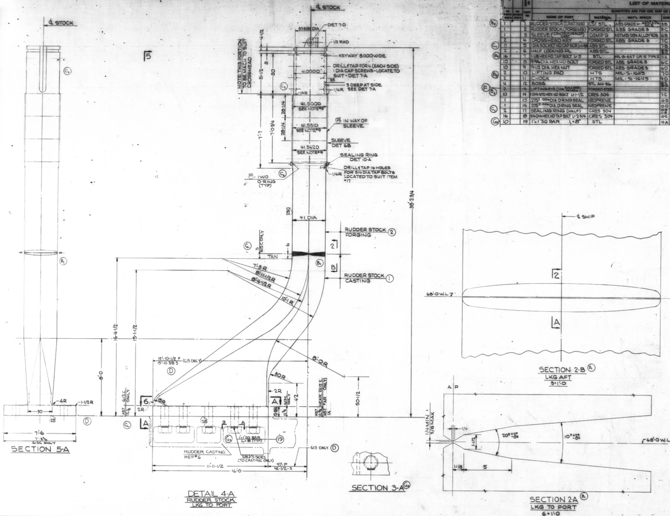
SEPT. '80

10X

FRAME 3


℄ STOCK
NOTE: THIS PORTION TO BE MACH TO SUIT CROSSHEAD
DET 7-D
57-31/32 DIA
1/2 RAD
KEYWAY 8.000 WIDE
DRILL & TAP FOR 4 (EACH SIDE) 1 DIA CAP SCREWS ~ LOCATE TO SUIT ~ DET 7-A
3 DEEP AT SIDE SEE DET 7-A
1/4R
41.000D
41.500D SEE NOTE #9
41.531D SEE NOTE #9
41.562D SEE NOTE #9
125 IN WAY OF SLEEVE
SLEEVE DET 6B
SEALING RING DET 10-A
DRILL & TAP 16 HOLES FOR 3/4 DIA TAP BOLTS LOCATED TO SUIT ITEM #17
32 1WO O-RING (TYP)
4-1/2
51-1/2
50
28-1/4
7'-7
7'-0-3/4
38'-2-3/4
41 DIA
RUDDER STOCK FORGING ②
RUDDER STOCK CASTING ①
TAN
615C ONLY
7'-3R
8'-11-1/2R
8'-4-1/2R
10'-1R
8'-0R
30R
2R
16'-4-1/2
15'-1-1/2
8'-0
15'-10-1/2 P 15'-11-3/8 S (613 ONLY)
50-1/2
42
12-3/4
ABT 12-7/8
NEAR (615 C ONLY) ABT FAR 14
RUDDER CASTING REF #6
1"x1" SQ BAR L=8 (TYP) ⑲
3/8 3-SIDES (TO CASTING ONLY)
11'-11-1/2
16'-0
47-P 46-1/2-S
613 ONLY Ⓓ
7'-6
7'-8 5/8 615C ONLY
4R
1-1/2R
℄ SHIP
68'-0 W.L.
1/4 MIN 3/8 MAX
20°+2° -0°
10°+2° -0°
1-1/2
1-1/8
5
A.P.

SECTION 5-A

DETAIL 4-A
RUDDER STOCK
LKG TO PORT

SECTION 3-A

SECTION 2-A
LKG TO PORT
6"=1'-0

SECTION 2-B
LKG AFT
3"=1'-0

LIST OF MATERIAL

QUANTITIES ARE FOR ONE SHIP OR ONE ASSEMBLY

NO PARTS REQ'D	NO SPARES REQ'D	PART NO	NAME OF PART	MATERIAL	MAT'L SPECS	ZONE	REFERENCE PLAN NO	SHOCK GRADE	UNIT WT LBS	REMARKS
1		1	RUDDER STOCK (CASTING)	CST STL	ABS GRADE 4 ~ ASTM A-216 WCB	3-B				
1		2	RUDDER STOCK (FORGING)	FORGED STL	ABS GRADE 3	3-C				
1		3	SLEEVE (CENTRIFUGALLY CAST)	COMP G	ASTM B-584 ALLOY 903	6-B				
2		4	CROSSHEAD KEY	FORGED STL	ABS GRADE 3	7-C				
8		5	1 DIA SOCKET HD CAP SCR L=6-5/8	ABS STL		7-B				8-UNC-2A
2		6	HALF LOCKING PL	ABS STL		8-A 8-C				
16		7	1-1/8 HEX HD TAP BOLT L=5	STL	MIL-B-857 GR 5 TYPE II	8-A				7-UNC-2A
10		8	9-9/16 DIA HEX HD BOLT	FORGED STL	ABS GRADE 3	6-C				
10		9	9-1/2 DIA. HEX NUT	FORGED STL	ABS GRADE 3	6-D				
2		10	LIFTING PAD	HTS	MIL-S-16113	7-D				
2		11	CHOCK	HTS	MIL-S-16113	9-D				
4		12	BOSS	STL AH-36		8-C 8-D				
~~2~~		~~13~~	~~LIFTING EYE (DIA SHOULDER PATTERN)~~	~~FORGED STEEL~~		~~7-C~~				[illegible]
10		14	1 DIA STD HEX HD BOLT L=1-1/2	CRES 304		7-C				8-UNC-2A
1		15	.275±.006 DIA O-RING SEAL	NEOPRENE		10-D				[illegible]
1		16	.275±.006 DIA O-RING SEAL	NEOPRENE		10-D				[illegible]
2		17	SEALING RING (HALF)	CRES 304		10-B 11-B				
16		18	3/4 DIA HEX HD TAP BOLT L=2-3/4	CRES 304		10-C				
10		19	1"x1" SQ BAR L=8"	STL		4-A				

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	AUTH'D	OWNER DATE	APP'D
A		INITIAL ISSUE R.D. RFC				
B	5A 1D 2B 1A	1. DET 4-A & 5-A: INDICATION OF BUTT WELD BETW CASTING & FORGING ALT & SECT 2-B TAKEN LKG AFT & DET 2-A ALT TO SECT 2-A. ALL TO CLARIFY WELD.				
	7C 8D	2. DET 6-C: LIFTING EYE ADDED IN HD OF PALM BOLTS & Pc #13 & 14 ADDED IN LIST OF MTL. 1/2 START PROJECTION ADDED & NOTE ADDED TO MAKE BOLTS TO SUIT HOLES IN STOCK & RUDDER CASTING. ALL TO FACILITATE INST.				
	8D 8C	3. SECT 8-C: ITEM #11 & 12 ALT TO HTS IN LIEU OF AH-36 & ITEM #12 ALT TO 56.1 IN LIEU OF 58.6 #RT. DESIGN DEVELOPMENT.				
	3D	4. IN L/M MATERIAL SPEC FOR ITEM #7 ALT FROM ASTM-A261-80 (OBSOLETE) TO MIL-B-857 GR 5				
	3D 1C	5. IN BILL MTL PART #1 IN MTL SPECS ASTM NO ADDED & IN GEN NOTES NOTE #7 DELETED & NOTE #12 ADDED. DESIGN DEVELOPMENT.				
		6. INITIAL ISSUE TO YARD R.D. RFC			1-7-76 ZAPATA 1-28-76 SHELL	
C	3D 7B 7D	1. IN L/M LG OF ITEM #5 ALT FROM 8-5/8 TO 6-5/8. DET 7-A DIA OF C'BORE ALT FROM 1-3/8 TO 1-9/16. DET 6-D DIM ACROSS COR ALT FROM 6-5/8 TO 6-7/16. PLAN CORRECTIONS. THIS RELEASES HOLD-UP #CSE 29.				
	7A 4A 4D 5D	2. DET 7-A: BOTTOM OF KEY ALT. SECT 9-A ADDED & DET 4-A & SECT 5-A ALT. ALL TO FACILITATE MACHINING AT YARD REQUEST.				
	7B	3. DET 7-A: JACKING BOLT HOLES ADDED FOR REMOVAL OF KEYS. DESIGN DEVELOPMENT.				
	4C 9A 10A 10C 5C	4. DET 4-A: O-RING ADDED AT BOTTOM OF SLEEVE. DET 10-A, 9-A1 & SECT 10-C ADDED & ITEM #15-18 ADDED IN LIST MTL. ALL TO SUIT OWNERS (SHELL) REQUEST. R.D. RFC			1-27-77 SHELL 2-21-77 ZAPATA	
D	4A 4B 5A 6A 6B 7A	1. DET 4-A, SECT 5-A: DIMENSIONS ADDED ON RUDDER STOCK (613 C ONLY). TO SUIT AS CAST BY NAT. FORGE. Ⓑ₅	KPM			
		2. GEN NOTE 13 ADDED				
E		GEN NOTE #13 DELETED DESIGN DEVELOPMENT.				
F	3D 7C 7D	1. DET 6-C, 6-D: HEX HEAD BOLT & NUT ALT. ITEM #13 (LIFTING EYE) DELETED IN L/M & IN DET 6-C. THIS INCORPORATES LIAISON SKETCHES OF 1-11-78, 1-16-78, & 1-17-78.	KPM			
G	4C 5A	1. 615C ONLY: DET 4-A; DIM LOCATING BUTT IN STOCK ALT FROM 6 TO 5 ABV TANGENT. DIM ADDED FOR THICKNESS OF BOLTING PALM. ALL TO SUIT AS CAST BY NATIONAL. (D.R. # 615C-M53-6933 APPVD BY LOCAL ABS & OWNER).				
	2A 3A 3D 4A	2. DET 4-A: 1"x1" SQ LOCKING BARS ADDED TO RUDDER CASTING IWO NUTS. PART No. 19 ADDED IN L/M. REF #6 ADDED. SECT 3-A ADDED. THIS INCORP LIAISON #MEM 469 OF 9/18/78.				
		3. APPLICABILITY TO 615C DELETED.	KPM			

AUTHORITY:

GENERAL NOTES:

1. FOR GENERAL NOTES PERTAINING TO STRUCTURAL PLANS SEE REF #1.
2. STEEL FORGINGS TO BE MANUFACTURED & TESTED IN ACCORDANCE WITH ABS RULES & REGULATIONS FOR THE CONSTRUCTION & CLASSIFICATION OF STEEL SHIPS.
3. MACHINE SURFACE SYMBOLS AND CONTROL NUMBERS ARE IN ACCORDANCE WITH ASA B46.1
4. RUDDER STOCK FORGING TO BE ABS GRADE 3 MATERIAL, IN ACCORDANCE WITH SECT 44.23.
5. AFTER HEAT TREATING, ALL ACCESSIBLE SURFACES OF ALL THE CSTGS SHALL BE MAGNETIC PARTICLE INSPECTED IN ACCORDANCE WITH ASTM-E-109 (N.N. PROCEDURE N-325). THE CSTG SURFACES SHALL BE FREE OF TEARS AND CRACKS AND OTHER LINEAR INDICATIONS EXCEPT CRAZING, IN EXCESS OF 1/4 & IN-LINE INDICATIONS 3/16 INCH OR MORE, WITH AN ACCUMLATED LENGTH OF 1-1/2 INCHES IN ANY 3 INCH SQUARE AND TO THE SATISFACTION OF THE ATTENDING SURVEYOR. IN WELD REPAIRED AREAS OF THE CASTING THE WELD SHALL BE OF LINEAR INDICATIONS (INDICATIONS 1/16 INCH AND LESS SHALL BE CONSIDERED NON LINEAR). ADJACENT BASE METAL SHALL MEET THE ABOVE CASTING SURFACE CRITERIA.
6. CASTING SHALL BE INSPECTED AND REPAIRED IN ACCORDANCE WITH SECTION 43.7.7 OF ABS RULES.
7. ~~CASTING TO BE WELDABLE QUALITY.~~
8. CASTING MATERIAL TO BE IN ACCORDANCE WITH SECT 44.17 (GRADE 4) OF ABS RULES.
9. RUDDER STOCK IS NOT TO BE TURNED UNTIL BORE OF SLEEVE HAS BEEN VERIFIED. SHRINK SLEEVE ON RUDDER STOCK WITH .031 SHRINK FIT.
10. ALL FITTED BOLTS TO BE FITTED IN REAMED HOLES TO ASSURE BODY-BOUND FIT. BOLTS & HOLES TO BE STAMPED WITH CORRESPONDING NUMBERS AFTER BOLTS ARE IN PLACE.
11. WELDING TO BE IN ACCORDANCE WITH WELDING ENGRS MEMO # 496.
12. CASTING & FORGING SHALL BE OF WELDABLE QUALITY (.30% CARBON MAXIMUM).
13. ~~KEY TO KEYWAY FIT TO HAVE 90% CONTACT.~~

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
~~615C~~	~~311~~	
614C	310	
613C	309	

APPROVALS

OWNERS	SHELL 5-14-76 ZAPATA 5-24-76	ABS REV C 2-1-77	6-10-76
		USCG REV C 2-10-77	6-21-76

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689

SCALE 1/2 & AS NOTED = 1 FT
DRAWN F.R. DICK
CHECKED R.F. CARMINE
SECT MGR M.C. Moore 3/24/76
DATE COMPL 3-29-76
EXAMINED
AUTHORIZED
DATE 3-29-76
TECH APPROVAL D.A.L. DAL A. Conley
C S D APPROVAL R.L. Harrington

390,000 DWT TANKER

RUDDER STOCK

U S M A DESIGN T11-S-116a
U S M A DWG NO. ____ HULL NO. ____

DWG NO. 1310-72 REV G SHEET NO. 1 OF 1

NO.	REFERENCES	DWG NO.
6	RUDDER CASTING ~ UPPER	1310-85
5	RUDDER STOCK BEARER & BEARINGS	1310-73
4	RUDDER ELEVATIONS	1310-70
3	RUDDER SECTIONS	1310-71
2	N.N. WELDING PROCEDURE	W-302
1	GEN'L NOTES PERTAINING TO HULL STRUCTURE	0100-749

FABRICATION NOTES
REV 6 ADDED 10-4-78

1310-72

GROUP: MC NO.

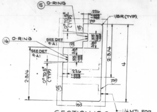
HT	DH	YD
105	113	133

Grouped For Hull 613, 614, 615 Date [illegible]
By [illegible] Sect. Mgr. [illegible]
1310-72 MFG RUDDER STOCK & SLEEVE
1310-404-1001 INSTALL RUDDER STOCK

REPRODUCTION OFFICE
YES
REV G

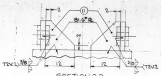
1310-72

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 1



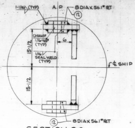
⑮ O-RING
1/8R (TYP)
⑯ O-RING
SEE DET 9-A1
0°TO5° (TYP)
2-3/4
2-5/4
4
250
1/4 MTL FOR MACHINING

SECTION 10-C
FULL SIZE



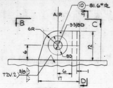
⑪
81.6° ℄
2
12
3/8
T2V2

SECTION 9-D
1-1/2=1'-0



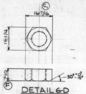
1-1/16 (TYP)
A.P.
8 DIA X 56.1° RT
⑫
CHAMF 1/16-45° (TYP)
1/16 SEAL WELD (TYP)
15-1/2
6
℄ SHIP

SECTION 8-C
1-1/2=1'-0



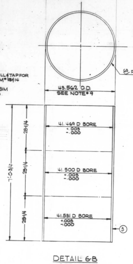
A.P.
⑩ 81.6° ℄
6R
3-3/8 D
8 D
12
6
17
T2V2
3/8
8
C
D

DETAIL 7-D
LIFTING PAD
1-1/2=1'-0



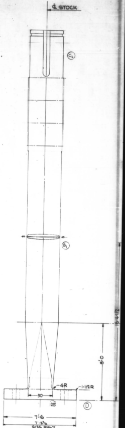
1-7/16
1-1/4
30°+0° -15°
F

DETAIL 6-D
HEX NUT
1=1'-0



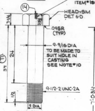
63 POLISH
43.562 O.D. SEE NOTE #9
41.469 D BORE +.005 -.000
41.500 D BORE +.005 -.000
41.531 D BORE +.005 -.000
28-1/4
1'-0-3/4
③

DETAIL 6-B
SLEEVE
1=1'-0



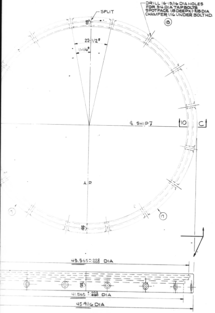
℄ STOCK
4R
1-1/2R
30
7'-6
7'-8-3/4
GISC ONLY
8-0
16-4-1/2
D

SECTION 5-A



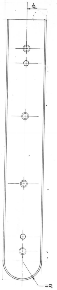
⑭
DRILL & TAP FOR ITEM #13/14
HEAD-SIM DET 6-D
.095R (TYP)
9-9/16 DIA TO BE MADE TO SUIT HOLE IN CASTING SEE NOTE #10
9-1/2-2 UNC-2A
9 DIA
24
34
1/2
⑰

DETAIL 6-C
HEX BOLT
1=1'-0

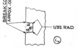


SPLIT
DRILL 16-13/16 DIA HOLES FOR 3/4 DIA TAP BOLTS SPOTFACE 1/8 DEEP X 1-3/8 DIA CHAMFER 1/16 UNDER BOLT HD.
⑱
22-1/2°
11-1/4°
℄ SHIP
10 C
A.P.
43.565 +.005 DIA
41.565 +.005 DIA
45-9/16 DIA

DETAIL 10-A
SEALING RING
3=1'-0

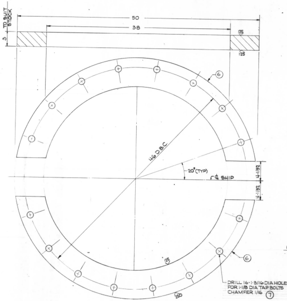


SECTION 9-A
3=1'-0



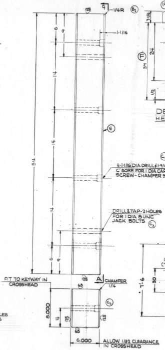
BREAK CORNERS APPROX .005 RAD
1/32 RAD

DETAIL 9-A1
NO SCALE



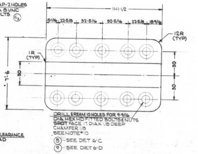
TO SUIT STOCK
50
38
3
⑥
46 D.B.C.
20° (TYP)
℄ SHIP
4-1/32
DRILL 16-1-3/16 DIA HOLES FOR 1-1/8 DIA TAP BOLTS CHAMFER 1/16 ⑦

DETAIL 8-A
LOCKING PLATE
3=1'-0



1/4R
1-1/16
54
14
④
4-1-1/16 DIA DRILL & 1-9/16 DIA C'BORE FOR 1 DIA CAP SCREW~CHAMFER 3/32 ⑤
DRILL & TAP-2 HOLES FOR 1 DIA 8UNC JACK BOLTS
FIT TO KEYWAY IN CROSSHEAD
CHAMFER 1/4
8.000
6.000
ALLOW 1/32 CLEARANCE IN CROSSHEAD

DETAIL 7-A
CROSSHEAD KEY
3=1'-0



11-1-1/2
15-1/16
22-5/8
32-5/16
32-5/16
22-5/8
18-9/16
12R (TYP)
1R (TYP)
30
7'-6
DRILL & REAM 10 HOLES FOR 9-9/16 DIA HEX HD FITTED BOLTS & NUTS SPOT FACE 17 DIA X 1/8 DEEP CHAMFER 1/8 SEE NOTE #10
⑧-SEE DET 6-C
⑨-SEE DET 6-D

SECTION 6A

1310-72

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
10X
FRAME 2

FABRICATION NOTES

REV. G ADDED 6-4-78

THE NOTES BELOW AND THE ONES MARKED G ARE FOR NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY USE FOR FABRICATION AND ERECTION PURPOSES ONLY. THEIR ADDITION TO THIS PLAN IS NOT MADE UNDER THE SUPERVISION OF THE HULL DESIGN DIVISION. THUS, THEY CAN IN NO WAY BE CONSTRUED AS AFFECTING OR MODIFYING THE DESIGN DEPICTED HEREIN OR ANY NON-DEVIATIONAL REQUIREMENTS.

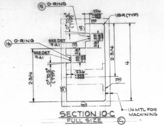
DWG NO: 1310-72 REV B,C,D,E,F,G

REV E 613-615 OUTFITTING

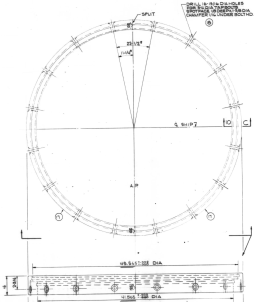
REV F 613-615 OUTFITTING

REV G 613/615 OUTFITTING

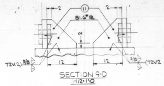
11 10 9


⑮ O-RING
⑯ O-RING
.226 +.005 -.000
1/8R (TYP)
0° TO 5° (TYP)
SEE DET 9-A1
SEE DET 9-A1
125
125
250
250
250
.315 +.005 -.000
3/8
3/8
2-3/4
2-3/4
4
.226 +.005 -.000
0° TO 5° (TYP)
1/4 MTL FOR MACHINING

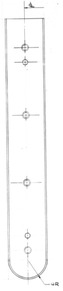
SECTION 10-C
FULL SIZE G


DRILL 16-13/16 DIA HOLES FOR 3/4 DIA TAP BOLTS SPOTFACE 1/8 DEEP X 1-3/8 DIA CHAMFER 1/16 UNDER BOLT HD.
⑱
SPLIT
125
22-1/2°
11-1/4°
℄ SHIP
10 C
A.P
⑰
⑰
125
43.565 +.002 -.000 DIA
4
2-3/4
125
41.565 +.002 -.000 DIA
45-9/16 DIA

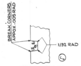
DETAIL 10-A G
SEALING RING
3=1'-0


2
⑪
2
81.6° ℄
2
T2V.2 3/8
12
12
3/8 T2V.2

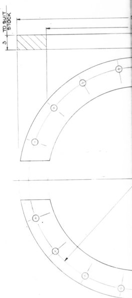
SECTION 9-D
1-1/2=1'-0



SECTION 9-A G
3=1'-0


BREAK CORNERS APPOX .005 RAD
1/32 RAD
G

DETAIL 9-A1
NO SCALE


1-1/16 (TYP)
15-1/2
15-1/2
10
TO SUIT STOCK
3

DET
LOC

11 10 9

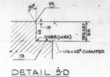
1310-72

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
Registered trademark of KEUFFEL & ESSER CO.

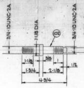
SEPT. '80

FRAME 3

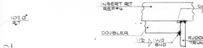
10X


30°
63
1/8
.048R (MAX)
SEE DET 6A
63
125
1/16 x 45° CHAMFER

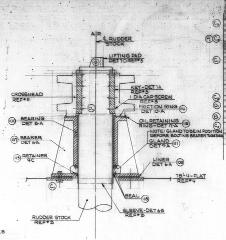
DETAIL 5-D
IN WAY OF CLIPPER SEAL RECESS


3/4-10UNC-2A
1-1/8 DIA
102
3/4-10UNC-2A
1/2 SQ HD
1-1/8
3/8
1-3/4
2-1/8
1/2
4-3/4

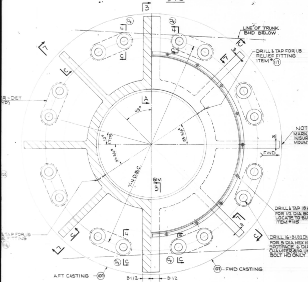
DETAIL 4-D
SHOULDER STUD
6=1'-0


INSERT PL REF #4
CHIP BACK IWO DOUBLER
102.0# PL
DOUBLER
1/2
IWO BHD
RUDDER STOCK TRUNK - REF #6

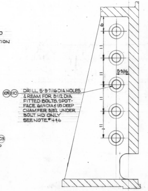
SECTION 4-C
3=1'-0


A/P
℄ RUDDER STOCK
LIFTING PAD DET 7-C REF #3
KEY-DET 7A REF #3
1 DIA CAP SCREW
FRICTION RING DET 10-A (114)
CROSSHEAD REF #5
BEARING DET 8-A (100)
OIL RETAINING RING - DET 12-A (115)
NOTE: GLAND TO BE IN POSITION BEFORE BOLTING BEARER TOGETHER
GLAND DET 9-A (111)
BEARER DET 6A (107)
RETAINER 9C (113)
LINER DET 6A (108)
78'-4 FLAT REF #4
SEAL (118)
SLEEVE-DET 6B REF #3
RUDDER STOCK REF #3

DETAIL 3-C
1/2=1'-0


LINE OF TRUNK BHD BELOW
DRILL & TAP FOR 1/8 RELIEF FITTING ITEM #117
NOTE MARK CASTING TO INSURE PROPER MOUNTING POSITION
FWD
45°
15° (TYP)
7'-4 D.C.
SIM 3
A
DRILL & TAP 18 HOLES FOR 1/2 DIA BOLTS LOCATE TO SUIT ITEM #115 (106)
DRILL 16-3-1/32 DIA HOLES FOR 3 DIA HEX HD BOLTS. SPOTFACE 6 DIA x 1/8 DEEP CHAMFER 3/16 UNDER BOLT HD ONLY (103)
FWD CASTING (107)
AFT CASTING (107)
8-1/2
8-1/2

SECTION 5-A
1-1/2=1'-0


DRILL 5-3-7/16 DIA HOLES & REAM FOR 3-1/2 DIA FITTED BOLTS, SPOT-FACE 6-1/4 DIA x 1/8 DEEP CHAM FER 3/32 UNDER BOLT HD ONLY SEE NOTE #4&6 (109) (110)
5-3/16

SECTION 3-A
FOR INFORMATION NOT GIVEN
SEE DET 6A
1-1/2=1'-0

LIST OF MATERIAL

QUANTITIES ARE FOR ONE SHIP OR ONE ASSEMBLY

NO PARTS REQ'D	NO SPARES REQ'D	PART NO	NAME OF PART	MATERIAL	MAT'L SPECS	ZONE	REFERENCE PLAN NO	SHOCK GRADE	UNIT WT LBS	REMARKS
2		100	HALF BEARING	JOURNAL BRONZE COMP H*		8-A				SEE NOTE #7
12		101	3/4 HEX HD TAP BOLT L=3-1/4	ABS STL		9-C				10 UNC-2A
4		102	3/4 DIA SHOULDER STUD	ABS STL		4-D				10 UNC-2A
16		103	3 STD HEX HD TAP BOLT L=8	ABS STL		4-A				4 UNC-2A
~~16~~		~~104~~	~~3 DIA STD HEX NUT~~	~~ABS STL~~		~~4-A~~				~~4 UNC-2B~~
~~16~~		~~105~~	~~GROMMET~~	~~LAMPWICK~~		~~4-A~~				
18		106	1/2 HEX HD TAP BOLT L=1	ABS STL		4-A 11-B				13 UNC-2A
2		107	HALF RUDDER BEARER	CAST STL	ASTM A27 GR 70-40	6-A				
1		108	BEARER LINER	ABS STL		1A				
10		109	3-1/2 FITTED BOLT L=11	ALLOY STL	ASTM A193, B7	4-B				4 UNC-2A
10		110	3-1/2 DIA STD HEX NUT	ALLOY STL	ASTM A 193, B7	4-B				4 UNC-2B
2		111	HALF GLAND	ABS STL		9A				
16		112	5/8 HEX HD TAP BOLT L=1-1/2	ABS STL		4D				11 UNC-2A
4		113	RETAINER (IN QUARTERS)	ABS STL		9C				
2		114	FRICTION RING (HALF)	JOURNAL BRONZE COMP H*		10A				SEE NOTE #7
2		115	OIL RING (HALF)	CAST STL	ASTM A-27-71 GR 60-30	12A				
1		116	1/8 GREASE FITTING	COML		5-A				
1		117	1/8 RELIEF FITTING	COML		4-C				
3		118	CLIPPER SEAL 1 x 45-9/16 I.D. x 48-9/16 O.D.		COML	5C				[illegible] MANVILLE TYPE RUP
2		119	1/2 DIA FITTED BOLT L=1-1/2	ABS STL		10-D				13 UNC-2A
2		120	1/2 DIA STD HEX NUT	ABS STL		10-D				13 UNC-2B
4		121	3/4 DIA STD HEX NUT	ABS STL		9-C				10 UNC-2B
8		122	102.0# DOUBLER	HTS	MIL-S-16113	[illegible]				

REVISIONS

REV	ZONE	DESCRIPTION		NNS&DD CO DATE	AUTHD	OWNER DATE	APPD
A		INITIAL ISSUE TO YD	R.D. RFC	[illegible]			
B	3D	1. IN L/M QUANTITY OF ITEM #118 ALT FROM 1 TO 3. PLAN CORRECTION.					
	6A	2. DET 6-A: FINISH DIM ABOVE ℄ TO TOP OF LINER ITEM #108 ADDED. PLAN DEVELOPMENT	RFC	[illegible]	[illegible]		
C	3D 10A	1. IN L/M ITEM #107 MAT SPEC ALT TO ASTM A 27 GR 70-40 IN LIEU OF ASTM A 217 WC6-GR 70-40. DET 10-A: OIL GROOVE EXT THRU DOVE TAIL IN LIEU OF ENDING 2 ON EITHER SIDE OF JOINT. DESIGN DEVELOPMENT.					
	5C 5D [illegible] 6A 3D	2. DOUBLERS ADDED IWO RUDDER HOLD DOWN BOLTS & TAP BOLTS USED IN LIEU OF THRU BOLTS. DET 6-C & SECT 6-D ADDED. DET 3-C SECT 5-A & DET 6-A ALT. IN L/M ITEM #104 & 105 DELETED. ITEM #103 ALT & ITEM #122 ADDED. ALL TO SUIT OWNERS (SHELL) PRINT & LETTER DTD 5-14-76 & (ZAPATA) PRINT & LETTER DTD 5-12-76					
	4A 12B 3C	3 SECT 5-A: 1/8 DEPTH ADDED FOR SPOTFACING OF BOLTS ITEM #103. DET 12-A: 1/2" THICKNESS NOTED FOR FLG CONNECTION & IN L/M ITEM #119 (LENGTH OF BOLT ALT TO 1-1/2 IN LIEU OF 1-1/8) PLAN CORRECTION.					
	3D	4. IN LIST OF MTL ITEM #100 & ITEM #114 MTL NOTED JOURNAL BRONZE (COMP H*) IN LIEU OF COMP H*. FOR CLARIFICATION.					
		5 HOLD UP #19 RELEASED	R.D. RFC	[illegible]	[illegible]	[illegible] [illegible]	ZAPATA SHELL
D	3C	1. IN L/M: ITEM #115 MAT SPECS ADDED.					
	1C	2 GEN NOTE #7 ALT TO READ COPPER 82 TO 84 IN LIEU OF 84, ZINC 2.5 TO 4.5 IN LIEU OF 4.5 & TIN 12.5 TO 14.5 IN LIEU OF 14.5 ALL TO SUIT OWNERS (ZAPATA) REQUEST.					
	4A	3 SECT 5-A: INDICATION & NOTE ADDED TO CHAMFER UNDER BOLD HD FOR HOLDING DWN BOLTS ALL TO PROVIDE CLEARANCE IWO RAD UNDER BOLT HD.					
	3C	4 DET 3-C: INDICATION OF KEY ALT TO SUIT REV TO KEY ON REF #7.					
	4C 5A 5C	5 SECT 5-A: ADDED SECT 4-C TAKEN IWO RUDDER TRUNK BHD TO FACILITATE WELDING OF DOUBLER TO BHD. ALL TO SUIT OWNERS (SHELL) LTR DATED 10-14-76	R.D. RFC	[illegible]	[illegible]	[illegible]	[illegible] SHELL
E	4C 7C	SECT 7-C ADDED TO FACILITATE LIFTING RUDDER BEARER. SECT 5-A MOD TO SUIT. THIS INCORPORATES LIAISON SK DTD 2-16-78.		[illegible]	[illegible]	[illegible]	[illegible]
F	3D	1. L/M: PART NO. 103, "L" ALT FROM 8-1/2" TO 8". THIS INCORP LIAISON #MEM-444 OF 8-30-78.					
	7A	2. DET 6-A: NOTE TO DRILL & TAP HOLES ADDED AT 44" RADIUS LOCATION IN BEARER LINER. TO FACILITATE HANDLING THIS INCORP LIAISON #MEM-445 OF 8-30-78. (WORK ACCOMP FOR HULL 613C).					
		3. APPLICABILITY TO 615C DELETED.	KPM CAH	[illegible]	[illegible]		

AUTHORITY:

GENERAL NOTES:

1. FOR GENERAL NOTES PERTAINING TO STRUCTURAL PLANS SEE REF #1.
2. ALL CASTINGS TO COMPLY WITH ABS RULES SECT 43.7.
3. SURFACE ROUGHNESS SYMBOLS SHOWN ON THIS DRAWING ARE IN ACCORDANCE WITH MIL-STD-10 DTD OCT 13, 1956.
4. ALL FITTED BOLTS TO BE FITTED IN REAMED HOLES TO ASSURE BODY-BOUND FIT. BOLTS & HOLES TO BE STAMPED WITH CORRESPONDING NUMBERS AFTER BOLTS ARE IN PLACE.
5. THE LINER ITEM #108 IS TO BE MACHINED EXCEPT FOR ONE FACE & THE O.D. & CLAMPED ON BASE OF BEARER. HOLES FOR THE HOLDING DOWN BOLTS ARE THEN DRILLED SIMULTANEOUSLY IN BEARER & LINER. FOR DRILLING HOLES IN THE INSERT PLATE THE LINER MAY BE USED AS A TEMPLATE. PRIOR TO THE INSTALLATION OF THE RUDDER STOCK & BEARER, THE 2ND FACE OF THE LINER IS TO BE MACHINED TO THE EXACT THICKNESS (1-1/2 NOMINAL) REQUIRED TO SUIT CONDITIONS ON SHIP. THE O.D. OF THE LINER IS TO BE MACHINED TO SUIT THE RECESS BORE ON THE SHIP.
6. ALL OIL TIGHT JOINTS TO BE COATED WITH PERMATEX BEFORE ASSEMBLY.
7. COMPOSITION "H": COPPER 82.0 TO 84.0, ZINC 2.5 TO 4.5, TIN 12.5 TO 14.5, LEAD 1.0 & IRON 0.10.

INSTALLATION NOTES FOR CLIPPER SEALS

1. THOROUGHLY CLEAN SEAL RECESS & RUDDER STOCK SLEEVE.
2. LUBRICATE STOCK SLEEVE, LIP OF SEAL AND SPRING GROOVE WITH "LUBRIPLATE" OR EQUAL.
3. APPLY SEALS BY SEPERATING ENDS AND PLACING SEAL AROUND RUDDER STOCK SLEEVE, WITH LIP FACING AS SHOWN ON DWG. CARE SHOULD BE EXERCISED IN ALL CASES TO PROTECT LIP OF SEAL FROM SHARP EDGES OF SURROUNDING STRUCTURE DURING INSTALLATION.
4. WITH SEAL IN PLACE AROUND STOCK, BUT NOT IN RECESS, BUTT ENDS OF SEALS TOGETHER AND MOUNT SPRING IN GROOVE MOLDED IN LIP OF SEAL.
5. ASSEMBLE WITH BUTT ENDS EVEN AND INSERT BUTT ENDS IN RECESS FIRST, ENTER SLIGHTLY AROUND AS MUCH OF SEAL RECESS AS POSSIBLE. TAP THE SEAL LIGHTLY ON THE PROTRUDING PORTION, WORKING UP BOTH SIDES UNTIL IT ENTERS THE RECESS. THEN TAP EVENLY INTO PLACE.
6. NEVER CUT OR TRIM ENDS OF SEAL, AS THEY ARE MADE TO PROVIDE A TIGHT FIT IN THE SEAL RECESS, ENDS OF SEAL ARE TO BE CEMENTED TOGETHER PRIOR TO INSERTING INTO THE STUFFING BOX.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
~~615C~~	~~311~~	
614C	310	
613C	309	

APPROVALS

OWNERS SHELL 5-14-6	ABS 6-10-76 'D' 2-1-7
	USCG 6-21-76 'D' 3-10-7

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT
FSCM NO. 43689

NO.	REFERENCES	DWG NO.
8		
7		
6	RUDDER STOCK TRUNK FR-5 TO FR 2 BLW 78'-4 LVL	1000-196
5	TILLER SHRE 18-625	2010M1 #3
4	FLAT 78'-4 ABV ℄ AFT FR 8-1/2	1140-98
3	RUDDER STOCK	1310-72
2	N.N. WELDING PROCEDURE	W 302
1	GENL NOTES PERTAINING TO HULL STRUCTURE	0100-749

SCALE AS NOTED = 1 FT
DRAWN F.R. DICK JR
CHECKED R.F. CARMINE
SECT MGR M.C. Moore 3/25/76
DATE COMPL 3-29-76
EXAMINED E.E. Stephenson
AUTHORIZED
DATE 3-29-76
TECH APPROVAL D.A.L. DAL A. Conley
C S D APPROVAL R.L. Harrington

390,000 DWT TANKER
RUDDER STOCK BEARER & BEARINGS

U S M A DESIGN T11-S-116a
U S M A DWG NO.
HULL NO.
DWG NO. 1310-73
REV F
SHEET NO. 1 OF 1

FABRICATION NOTES
REV. E ADDED 4-5-78

REPRODUCTION OFFICE
YES
YES
REV F

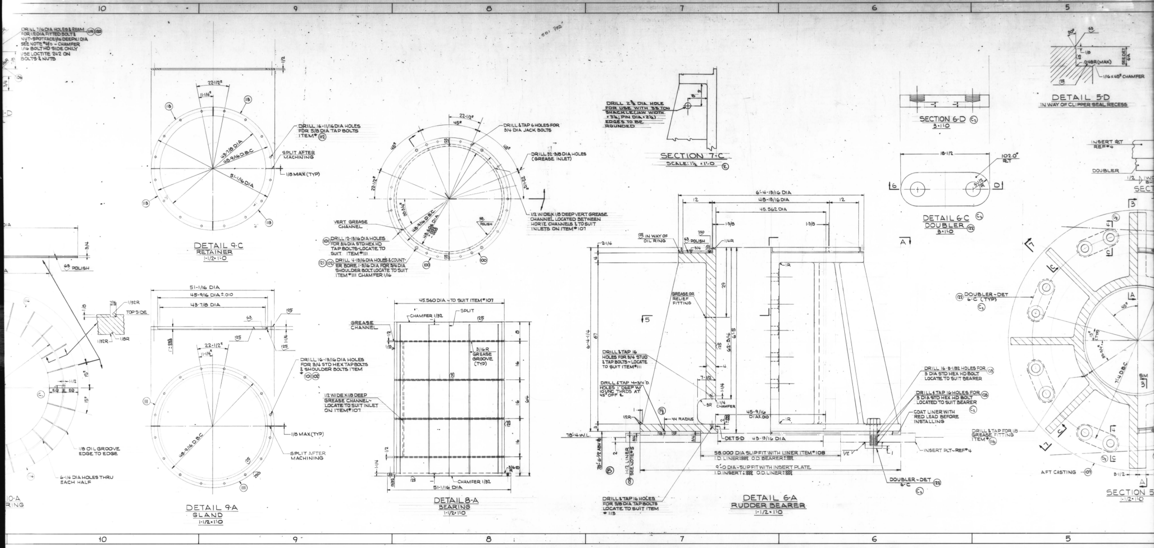
GROUP:
MC NO.

HT	DH	YD
105	113	130

Grouped For Hull [illegible] Date [illegible]
By [illegible] Sect. Mgr. [illegible]
1310-73 MFG. RUDDER STOCK BEARER & BEARINGS
1310-406-1001 RUDDER STOCK BEARER & BEARINGS

1310-73

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 1
10X



10
9
8
7
6
5
DRILL 7/16 DIA HOLES & REAM FOR 1/2 DIA FITTED BOLTS & NUT-SPOTFACE 1/16 DEEP X 1 DIA SEE NOTE #4 1/16 BOLT HD SIDE ONLY USE LOCTITE 242 ON BOLTS & NUTS
DETAIL 9-C
RETAINER
1-1/2=1'-0
22-1/2°
11-1/4°
43-7/8 DIA
48-9/16 D.B.C.
51-1/16 DIA
DRILL 16-11/16 DIA HOLES FOR 5/8 DIA TAP BOLTS ITEM # 112
SPLIT AFTER MACHINING
1/8 MAX (TYP)
DRILL & TAP 6 HOLES FOR 3/4 DIA JACK BOLTS
DRILL 32-3/8 DIA HOLES (GREASE INLET)
1/2 WIDE X 1/8 DEEP VERT GREASE CHANNEL LOCATED BETWEEN HORIZ CHANNELS & TO SUIT INLETS ON ITEM # 107
VERT GREASE CHANNEL
DRILL 12-13/16 DIA HOLES FOR 3/4 DIA STD HEX HD TAP BOLTS-LOCATE TO SUIT ITEM # 111
DRILL 4-13/16 DIA HOLES & COUNTER BORE 1-3/16 DIA FOR 3/4 DIA SHOULDER BOLT LOCATE TO SUIT ITEM # 111 CHAMFER 1/16
63 POLISH
51-1/16 DIA
45-9/16 DIA ±.010
43-7/8 DIA
TOP SIDE
1/32R
1/8R
DRILL 16-13/16 DIA HOLES FOR 3/4 STD HEX TAP BOLTS & SHOULDER BOLTS ITEM 101 102
1/8 MAX (TYP)
SPLIT AFTER MACHINING
DETAIL 9-A
GLAND
1-1/2=1'-0
1/8 OIL GROOVE EDGE TO EDGE
6-1/4 DIA HOLES THRU EACH HALF
45.560 DIA ~ TO SUIT ITEM # 107
SPLIT
CHAMFER 1/32
GREASE CHANNEL
3/16 R GREASE GROOVE (TYP)
1/2 WIDE X 1/8 DEEP GREASE CHANNEL~ LOCATE TO SUIT INLET ON ITEM # 107
51-1/16 DIA
CHAMFER 1/32
DETAIL 8-A
BEARING
1-1/2=1'-0
DRILL 2 3/8 DIA HOLE FOR USE WITH 35 TON SHACKLE (JAW WIDTH =3 1/4, PIN DIA =2 1/4) EDGES TO BE ROUNDED
SECTION 7-C
SCALE: 1 1/2 = 1'-0
6'-4-13/16 DIA
48-13/16 DIA
45.562 DIA
125 IN WAY OF OIL RING
63 POLISH
GREASE OR RELIEF FITTING
DRILL & TAP 16 HOLES FOR 3/4 STUD & TAP BOLTS~ LOCATE TO SUIT ITEM # 111
DRILL & TAP 4-3/4 D HOLES 1" DEEP W/ 10 UNC THRDS AT 45° OFF ℄
44 RADIUS
45-9/16 DIA ±.010
DET 5-D
43-13/16 DIA
58.000 DIA SLIP FIT WITH LINER ITEM # 108
9'-0 DIA ~ SLIP FIT WITH INSERT PLATE
78'-4 W.L.
78'-6-1/2 ABV ℄
1-1/2 LINER SEE NOTE # 5
DRILL & TAP 16 HOLES FOR 5/8 DIA TAP BOLTS LOCATE TO SUIT ITEM # 113
DETAIL 6-A
RUDDER BEARER
1-1/2=1'-0
DRILL 16-3-1/32 HOLES FOR 3 DIA STD HEX HD BOLT LOCATE TO SUIT BEARER
DRILL & TAP 16 HOLES FOR 3 DIA STD HEX HD BOLT LOCATED TO SUIT BEARER
COAT LINER WITH RED LEAD BEFORE INSTALLING
INSERT PLT~REF # 4
DOUBLER~DET 6-C
SECTION 6-D
3=1'-0
18-1/2
102.0° PLT
DETAIL 6-C
DOUBLER
3=1'-0
DOUBLER~DET 6-C (TYP)
DRILL & TAP FOR 1/8 GREASE FITTING ITEM # 116
AFT CASTING 107
DETAIL 5-D
IN WAY OF CLIPPER SEAL RECESS
.048R (MAX)
1/16 X 45° CHAMFER
INSERT PLT REF # 4
DOUBLER
SECTION 5
1-1/2=1'-0

1310-73

MICRO-MASTER 105 mm

K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 2

10X

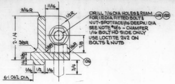
FABRICATION NOTES

REV. E ADDED 9-28-78

THE NOTES BELOW AND THE ONES MARKED Ø ARE FOR NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY USE FOR FABRICATION AND ERECTION PURPOSES ONLY. THEIR ADDITION TO THIS PLAN IS NOT MADE UNDER THE SUPERVISION OF THE HULL DESIGN DIVISION. THUS, THEY CAN IN NO WAY BE CONSTRUED AS AFFECTING OR MODIFYING THE DESIGN DEPICTED HEREIN OR ANY NON-DEVIATIONAL REQUIREMENTS.

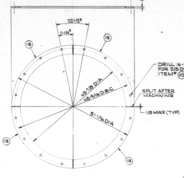
DWG 1310-73 REV E, F

REV E OUTFITTING
REV F OUTFITTING



3/16R
11/16
1/2R
2-1/4
3/8R
1/8R
1/16R
7/8
1-1/4
3/16
1/16
1/2
1/16
3/4
6-1.062 DIA
106
DRILL 7/16 DIA HOLES & REAM FOR 1/2 DIA FITTED BOLT & NUT~SPOTFACE 1/16 DEEP X 1 DIA SEE NOTE #4/6 ~ CHAMFER 1/16 BOLT HD SIDE ONLY USE LOCTITE 242 ON BOLTS & NUTS
119 120

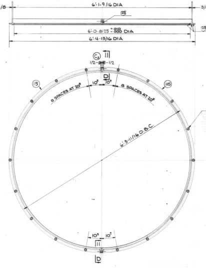
DETAIL 11-D
FULL SIZE



1/2
22-1/2°
11-1/4°
113
43-7/8 DIA
48-9/16 D.B.C
51-1/16 DIA
DRILL 16-11/16 DIA HOLES FOR 5/8 DIA TAP BOLTS ITEM # 112
SPLIT AFTER MACHINING
1/8 MAX (TYP)

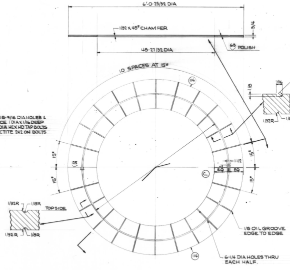
DETAIL 9-C
RETAINER
1-1/2=1'-0

45°
22-1/2°
30-3/4°
VERT GREASE CHANNEL
101 DRILL 12-13/16 DIA HOLES FOR 3/4 DIA STD HEX HD TAP BOLTS~LOCATE TO SUIT ITEM #111
121 102 DRILL 4-13/16 DIA HOLES & COUNTER BORE 1-3/16 DIA FOR 3/4 DIA SHOULDER BOLT LOCATE TO SUIT ITEM #111 CHAMFER 1/16
GREASE CHANNEL
CHAM
1/2
1/8
1/2
1-1/4
13/32
125



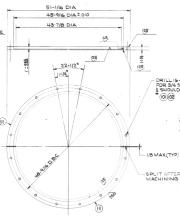
3/8
6'-1-9/16 DIA
3/8
125
6'-0-.8125 +.010 -.000 DIA
6'-4-13/16 DIA
125
C3
11
1/2
1/2
D
10°
10°
8 SPACES AT 20°
8 SPACES AT 20°
115
115
6'-3-11/16 D.B.C.
DRILL 18-9/16 DIA HOLES & SPOTFACE 1 DIA X 1/16 DEEP FOR 1/2 DIA HEX HD TAP BOLTS USE LOCTITE 242 ON BOLTS
106
10°
10°
11
D

DETAIL 12-A
OIL RING
1-1/2=1'-0



6'-0-25/32 DIA
1/32 X 45° CHAMFER
3/4
48-27/32 DIA
63 POLISH
10 SPACES AT 15°
114
1/8
7/16
1/32R
TOP SIDE
1/32R
1/8R
15°
15°
125
1-1/2
C1
EQ
EQ
15°
15°
1/32R
1/8R
TOP SIDE
1/32R
1/8R
1/8 OIL GROOVE EDGE TO EDGE
6-1/4 DIA HOLES THRU EACH HALF.
114

DETAIL 10-A
FRICTION RING
1-1/2=1'-0

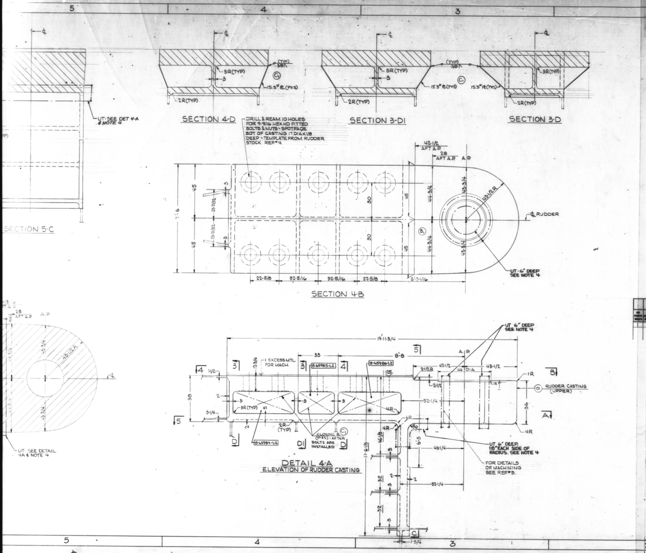


51-1/16 DIA
45-9/16 DIA ±.010
43-7/8 DIA
125
63
125
125
1 +.062 -.000
1-1/4
22-1/2°
11-1/4°
DRILL 16-13/16 DIA HOLES FOR 3/4 STD HEX TAP BOLTS & SHOULDER BOLTS ITEM # 101 102
1/2 WIDE X 1/8 DEEP GREASE CHANNEL~LOCATE TO SUIT INLET ON ITEM # 107
111
1/8 MAX (TYP)
48-9/16 D.B.C
SPLIT AFTER MACHINING
125
250
111

DETAIL 9-A
GLAND
1-1/2=1'-0

1310 - 73

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 3
10X


SECTION 4-D
SECTION 3-D1
SECTION 3-D
SECTION 5-C
SECTION 4-B
DETAIL 4-A
ELEVATION OF RUDDER CASTING
3R(TYP)
2R(TYP)
15.3" PL (P&S)
(TYP) 3/8
UT-SEE DET 4-A & NOTE 4
DRILL & REAM 10 HOLES FOR 9-9/16 HEX HD FITTED BOLTS & NUTS - SPOTFACE BOT. OF CASTING 17 DIA X 1/8 DEEP - TEMPLATE FROM RUDDER STOCK REF #4.
42-1/2 AFT A.P.
28 AFT A.P. A.P.
℄ RUDDER
UT-6" DEEP SEE NOTE 4
22-5/8
32-5/16
32-5/16
22-5/8
5-7-1/16
45
30
44-3/4
43-3/4
43-1/2 R
7'-6
UT-SEE DETAIL 4A & NOTE 4
UT 6" DEEP SEE NOTE 4
19'-11-3/4
1 EXCESS MTL FOR MACH.
33
8'-8
8-65985-1,2
8-65986-1,2
8-65984-1,2
42-1/2
44 DIA
43-1/2
2-1/2 R
1R
RUDDER CASTING (UPPER)
101
52-1/4
38
36
4R
3R(TYP)
2R (TYP)
CLOSING PL (P&S) - AFTER BOLTS ARE INSTALLED
UT 6" DEEP 18" EACH SIDE OF RADIUS. SEE NOTE 4
FOR DETAILS OF MACHINING SEE REF #3.
46-1/4
32-1/4
11'-6-1/8
32
1-3/4

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH	OWNER DATE	OWNER APPD
A		INITIAL ISSUE TO YD	FRD RFC	3-1-6		
B	3C	1 SECT 4-B: INDICATION OF 44 DIA & INDICATION OF RECESS 42-1/2 AFT A.P. ADDED TO AGREE WITH DET 4-A TO SUIT OWNERS APP (ZAPATA) DTD 4-2-76	RD RFC			
C	3D 4A 4D	1. DET 4-A & SECT 3-D, D1, 4-D: 15.3" CLOSING PLTS ADDED (P&S). TO SUIT OWNER. THIS INCORP LIAISON # MEM-474 OF 9-20-78.				
		2. APPLICABILITY TO 615C DELETED.				
		3. GEN NOTE #4: LAST PARAGRAPH DELETED. PLAN CORRECTION	KPM	9-20-78		

PWK 3-22-76
CBM 3-22-76
5-14-76 C.G. N.G.

AUTHORITY:

GENERAL NOTES:

1. CASTING SHALL BE INSPECTED AND REPAIRED IN ACCORDANCE WITH SECT 43.7.7 OF ABS RULES.
2. CASTING TO BE WELDABLE QUALITY.
3. MATERIAL TO BE IN ACCORDANCE WITH SECT 43.7 OF ABS RULES.
4. AFTER HEAT TREATING, ALL ACCESSIBLE SURFACES OF ALL THE CSTGS SHALL BE MAGNETIC PARTICLE INSPECTED IN ACCORDANCE WITH ASTM-E-109 (N.N. PROCEDURE N-325). THE CASTING SURFACES SHALL BE FREE OF TEARS AND CRACKS AND OTHER LINEAR INDICATION, EXCEPT CRAZING, IN EXCESS OF 1/4 & IN-LINE INDICATIONS 3/16 INCH OR MORE, WITH AN ACCUMULATED LENGTH OF 1-1/2 INCHES IN ANY 3 INCH SQUARE AND TO THE SATISFACTION OF THE ATTENDING SURVEYOR. IN WELD REPAIRED AREAS OF THE CASTING THE WELD SHALL BE FREE OF LINEAR INDICATIONS (INDICATIONS 1/16 INCH AND LESS SHALL BE CONSIDERED NON-LINEAR). ADJACENT BASE METAL SHALL MEET THE ABOVE CASTING SURFACE CRITERIA.

   CASTING AREAS MARKED FOR ULTRASONIC INSPECTION SHALL BE INSPECTED IN ACCORDANCE WITH ASTM A-609 AND MEET LEVEL 3 ACCEPTANCE CRITERIA.

   ~~AFTER WELDING AND STRESS RELIEVING THE CASTING WELD JOINTS SHALL BE MAGNETIC PARTICLE INSPECTED IN ACCORDANCE WITH ASTM-E-109 (N.N. PROCEDURE N-325). THE WELD SHALL BE FREE OF LINEAR INDICATIONS (INDICATIONS 1/16 AND LESS SHALL BE CONSIDERED NON-LINEAR) ADJACENT BASE METAL SHALL MEET THE ABOVE CRITERIA FOR CASTING SURFACES.~~
5. APPROVED WELDING PROCEDURE FOR WELDING TO THE OTHER PLATES OR APPROVED WELDING PROCEDURE TO THE SATISFACTION OF THE ATTENDING SURVEYOR.

DWG. REV — HULL APPLIC			
REV	NN HULLS ONLY 613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	—

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING YES
REMARKS REV C
DATE 9-28-78 SIGNED MC Moore

GROUP: MC NO.

HT	DH	YD

Grouped For Hull 613C, 614C, 615C Date 3-26-76
By C.B.M. Sect Mgr. WAR

1310-85 - MO FOR ROUGH MACHINING & WELD PREP OF UPPER RUDDER CASTING

LIST OF MATERIAL
QUANTITIES ARE FOR ONE SHIP OR ONE ASSEMBLY

NO PARTS REQ'D	NO SPARES REQ'D	ASSY NO / PART NO	NAME OF PART	MATERIAL	MAT'L SPECS	ZONE	REFERENCE PLAN NO	SHOCK GRADE	UNIT WT. LBS	REMARKS
1		101	RUDDER CASTING (UPPER)	CAST STEEL	GR 60-30	3-B				

NO.	REFERENCES	DWG NO.
4.	RUDDER STOCK	1310-72
3.	RUDDER SECTIONS	1310-71
2.	STRUCTURAL DETAILS	0100-750
1.	GEN NOTES PERTAINING TO HULL STRUCTURE	0100-749

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS
OWNERS SHELL 4-22-76 ZAPATA 4-2-76
ABS 5-10-76
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP DESIGN DEPT

SCALE 3/4 = 1 FT
DRAWN F.R. DICK JR
CHECKED R.F. CARMINE
SECT MGR MC Moore 3/12/76
DATE COMPL. 3-18-76
EXAMINED
AUTHORIZED
DATE 3-15-76
TECH APPROVAL C.J.G. A. Conley
CSD APPROVAL R. L. Harrington

390,000 DWT TANKER
RUDDER CASTING ~ UPPER

USMA DESIGN 711-5-1162
USMA DWG NO. HULL NO.
DWG NO. 1310-85 REV C SHEET NO. 1 OF 1

1310-85

FABRICATION NOTES
REV. C ADDED 10-4-78

1310-85

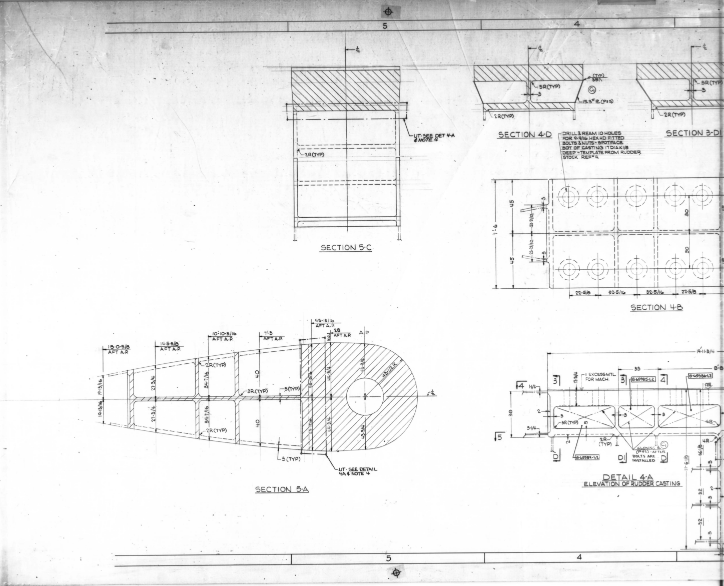
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 1

FABRICATION NOTES
REV. C ADDED 10-4-78

THE NOTES BELOW AND THE ONES MARKED Ø ARE FOR NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY USE FOR FABRICATION AND ERECTION PURPOSES ONLY. THEIR ADDITION TO THIS PLAN IS NOT MADE UNDER THE SUPERVISION OF THE HULL DESIGN DIVISION, THUS, THEY CAN IN NO WAY BE CONSTRUED AS AFFECTING OR MODIFYING THE DESIGN DEPICTED HEREIN OR ANY NON-DEVIATIONAL REQUIREMENTS.

613C - 615C
DWG. 1310-85 REV. "A", B, C

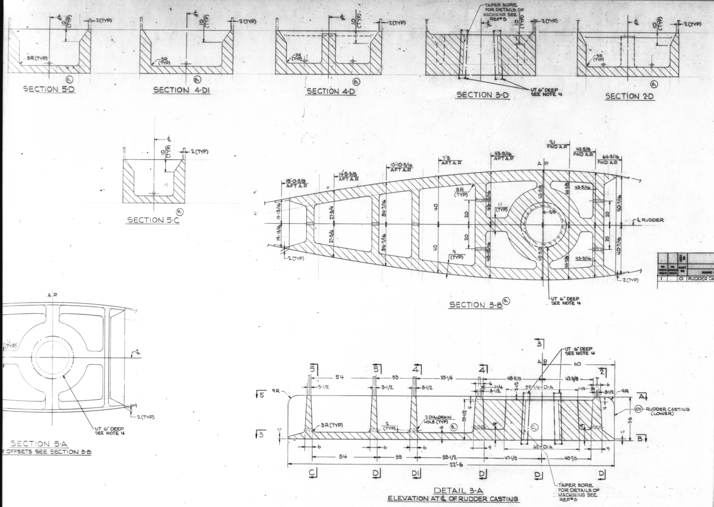
1. STOREROOM △B
   - A. FURNISH UPPER RUDDER CASTING, PART # 101, TO M50 DIVISION.
2. X-14 MOLD LOFT △C WA
   - A. FURNISH TEMPLATES TO M50 DIVISION FOR MACHINING AND WELD PREPARATION OF CASTING.
3. X-15 FAB SHOP △C WA
4. M-50 DIVISION
   - A. LAY OFF AND PRE-MACHINE RUDDER CASTING, LEAVING 1/4 INCH ON RADIUS OF BORE FOR FINAL MACHINING AFTER SUB-ASSEMBLY.
   - B. SEND TO X-12 SHOPFITTERS.
5. X-11 △C WA WA


5
4
SECTION 5-C
UT-SEE DET 4-A & NOTE 4
2R (TYP)
SECTION 4-D
3R (TYP)
2R (TYP)
15.3# R (P25)
SECTION 3-D
DRILL & REAM 10 HOLES FOR 9-9/16 HEX HD FITTED BOLTS & NUTS - SPOTFACE BOT OF CASTING 17 DIA X 1/8 DEEP - TEMPLATE FROM RUDDER STOCK REF #4.
SECTION 4-B
7'-6
45
45
30
22-5/8
32-5/16
32-5/16
22-5/8
SECTION 5-A
18-0-5/8 AFT A.P.
14-5-3/8 AFT A.P.
10'-10-3/16 AFT A.P.
7'-3 AFT A.P.
43-13/16 AFT A.P.
28 AFT A.P.
A.P.
19-13/16
27-3/4
34-7/16
40
44-3/4
43-3/4
43-1/2 R
3R (TYP)
3 (TYP)
2R (TYP)
UT-SEE DETAIL 4A & NOTE 4
℄
DETAIL 4-A
ELEVATION OF RUDDER CASTING
19'-11-3/4
1 EXCESS MTL FOR MACH.
33
8-65985-1,2
8-65986-1,2
8-65984-1,2
CLOSING PL (P25) AFTER BOLTS ARE INSTALLED
4R
11-6 1/8
32

1310-85

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 2
10X



5
4
3
2
1
-2(TYP)
10 (TYP)
3R(TYP)
SECTION 5-D
SECTION 4-D1
SECTION 4-D
TAPER BORE FOR DETAILS OF MACHINING SEE REF#3
SECTION 3-D
UT 6" DEEP SEE NOTE 4
SECTION 2-D
SECTION 5-C
18'-0-5/8 AFT A.P.
14'-5-3/8 AFT A.P.
10'-10-3/16 AFT A.P.
7'-3 AFT A.P.
43-3/16 AFT A.P.
21 FWD A.P.
42-5/8 FWD A.P.
64-3/16 FWD A.P.
A.P.
¢ RUDDER
19-13/16
21-3/4
34-7/16
40
20
11 (TYP)
9 (TYP)
43-15/16
45-3/8
44-7/8
43-5/16
40-7/16
SECTION 3-B
SECTION 5-A
FOR OFFSETS SEE SECTION 3-B
UT 6" DEEP SEE NOTE 4
9R
54
33
55-1/4
48-5/8
60
42-3/8
3-1/2
59-1/4 DIA
62 DIA
2-DIA DRAIN HOLE (TYP)
101 RUDDER CASTING (LOWER)
36
55-1/2
47-1/8
40-7/8
22'-6
DETAIL 3-A
ELEVATION AT ¢ OF RUDDER CASTING
TAPER BORE FOR DETAILS OF MACHINING SEE REF#3

REV	ZONE	DESCRIPTION		NN S & DD CO DATE	AUTHD	OWNER DATE	APPD
A		INITIAL ISSUE TO YD	R.D. RFG	3-3-1			
B	3A,3B 1D,1D1 5C,5D	1. DET 3-A: 2 DIA DRAIN HOLES ADDED IN CASTING AND INDICATED IN SECT 2-D, 3-B, 4-D, 4-D1, 5-C & 5-D. ALL TO PROVIDE DRAINAGE TO BLEEDER PLUGS.	R.D. RFG				
C		1. DET 3-A: INDICATION OF DRAIN HOLE IN WAY OF PINTLE DELETED. PLAN CORRECTION.	R.D. RFG				

AUTHORITY:

GENERAL NOTES:

1. CASTING SHALL BE INSPECTED AND REPAIRED IN ACCORDANCE WITH SECTION 43.7.7 OF ABS RULES.
2. CASTING TO BE WELDABLE QUALITY.
3. MATERIAL TO BE IN ACCORDANCE WITH SECT 43.7 OF ABS RULES.
4. AFTER HEAT TREATING, ALL ACCESSIBLE SURFACES OF ALL THE CSTGS SHALL BE MAGNETIC PARTICLE INSPECTED IN ACCORDANCE WITH ASTM-E-109 (N.N. PROCEDURE N-325. THE CASTING SURFACES SHALL BE FREE OF TEARS AND CRACKS AND OTHER LINEAR INDICATIONS, EXCEPT CRAZING, IN EXCESS OF 1/4 INCH & INLINE INDICATIONS 3/16 INCH OR MORE WITH AN ACCUMULATED LG OF 1-1/2 INCHES IN ANY 3 INCH SQUARE & TO THE SATISFACTION OF THE ATTENDING SURVEYOR. IN WELD REPAIRED AREAS OF THE CASTING THE WELD SHALL BE FREE OF LINEAR INDICATIONS (INDICATIONS 1/16 INCH AND LESS SHALL BE CONSIDERED NON-LINEAR). ADJACENT BASE METAL SHALL MEET THE ABOVE CASTING SURFACE CRITERIA.
   CASTING AREAS MARKED FOR ULTRASONIC INSPECTION SHALL BE INSPECTED IN ACCORDANCE WITH ASTM A-609 AND MEET LEVEL-3 ACCEPTANCE CRITERIA.
   ~~AFTER WELDING AND STRESS RELIEVING THE CASTING WELD JOINTS SHALL BE MAGNETIC PARTICLE INSPECTED IN ACCORDANCE WITH ASTM E-109 (N.N. PROCEDURE N-325) THE WELD SHALL BE FREE OF LINEAR INDICATIONS (INDICATIONS 1/16 INCH AND LESS SHALL BE CONSIDERED NON-LINEAR) ADJACENT BASE METAL SHALL MEET THE ABOVE CRITERIA FOR CASTING SURFACES.~~
5. APPROVED WELDING PROCEDURE FOR WELDING TO THE OTHER PLATES OR APPROVED WELDING PROCEDURE TO THE SATISFACTION OF THE ATTENDING SURVEYOR.

4 LAST DELETED

LIST OF MATERIAL

QUANTITIES ARE FOR ONE SHIP OR ONE ASSEMBLY

NO PARTS REQ'D	NO SPARES REQ'D	ASSY NO / PART NO	NAME OF PART	MATERIAL	MAT'L SPECS	ZONE	REFERENCE PLAN NO	SHOCK GRADE	UNIT WT LBS	REMARKS
1		101	RUDDER CASTING (LOWER)	CAST STEEL	GR 60-30	2-A				

NO.	REFERENCES	DWG NO.
6		
5		
4		
3	RUDDER SECTIONS	1310-71
2	STRUCTURAL DETAILS	0100-750
1	GEN NOTES PERTAINING TO HULL STRUCTURE	0100-749

NN S & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS
OWNERS SHELL 4-26-76 ZAPATA 5-12-76
ABS 5-10-76
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT
FSCM NO. 43689

SCALE 3/4 = 1 FT
DRAWN F.R. DICK JR
CHECKED R.F. CARMINE
SECT MGR 3/9/76
DATE COMPL. 3-9-76
EXAMINED
AUTHORIZED
DATE 3-10-76
TECH APPROVAL C.J.G.
CSD APPROVAL R.L. Warrington

390,000 DWT TANKER
RUDDER CASTING ~ LOWER

USMA DESIGN T11-S-1162
USMA DWG NO.
HULL NO.
DWG NO. 1310-86
REV C
SHEET NO. 1 OF 1

1310-86

GROUP:
MC NO.

HT	DH	YD
106	114	132

Grouped For Hull 613C, 614C, 615C Date 3-26-76
By CBM Sect. Mgr. WAE

1310-86 - MO FOR ROUGH MACHINING & WELD PREP OF LOWER RUDDER CASTING

FABRICATION NOTES
REV C ADDED 8-18-76

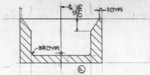
1310-86
MICRO-MASTER 105 mm
K+E
SEPT. '80
10X
FRAME 1

FABRICATION NOTES
REV. C ADDED 8-18-76

THE NOTES BELOW AND THE ONES MARKED Ø ARE FOR NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY USE FOR FABRICATION AND ERECTION PURPOSES ONLY. THEIR ADDITION TO THIS PLAN IS NOT MADE UNDER THE SUPERVISION OF THE HULL DESIGN DIVISION. THUS, THEY CAN IN NO WAY BE CONSTRUED AS AFFECTING OR MODIFYING THE DESIGN DEPICTED HEREIN OR ANY NON-DEVIATIONAL REQUIREMENTS.

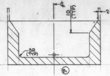
613C - 615C
DWG. 1310-86 REV. "A", B, C

1. STOREROOM △B △C
   - A. FURNISH LOWER RUDDER CASTING, PART # 101, TO M50 DIVISION.
2. X-14 MOLD LOFT
   - A. FURNISH TEMPLATES TO M50 DIVISION FOR MACHINING AND WELD PREPARATION OF CASTING.
3. M-50 DIVISION
   - A. LAY OFF AND PRE-MACHINE RUDDER CASTING (EXCEPT BORE FOR RUDDER STOCK - BORE TO BE MACHINED ON SHIP - LEAVE 1/2 INCH ON RADIUS).
   - B. SEND TO X-12 SHOPFITTERS.



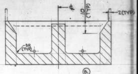
℄
10 (TYP)
2 (TYP)
3R (TYP)
B

SECTION 5-D



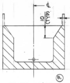
℄
10 (TYP)
2 (TYP)
3R (TYP)
B

SECTION 4-D1



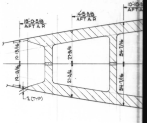
℄
10 (TYP)
2 (TYP)
3R (TYP)
B

SECTION 4-D

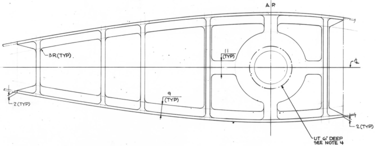


℄
10 (TYP)
2 (TYP)
B

SECTION 5-C

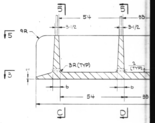


18'-0-5/8 AFT A.P.
14'-5-3/8 AFT A.P.
10'-10-3
AFT A
19-13/16
19-13/16
27-3/4
27-3/4
34-7/16
34-7/16
2 (TYP)



A.P.
3R (TYP)
11 (TYP)
℄
9 (TYP)
2 (TYP)
2 (TYP)
UT 6" DEEP SEE NOTE 4

SECTION 5-A
FOR OFFSETS SEE SECTION 3-B



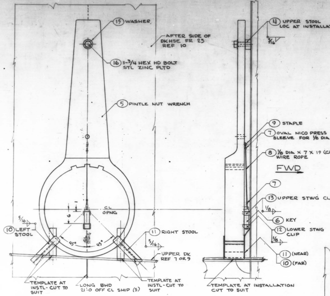
5
5
54
33
3-1/2
3-1/2
5
9R
3R (TYP)
2 (TYP)
3
2
6
6
54
33
C
D

ELE

1310-86

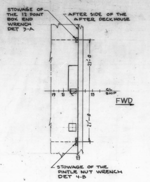
MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80
10X
FRAME 2



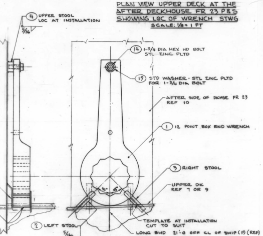
15 WASHER
AFTER SIDE OF DKHSE FR 23 REF 10
16 1-3/4 HEX HD BOLT STL ZINC PLTD
5 PINTLE NUT WRENCH
CL OPNG
CL STWG
6
45°
45°
5/16
10 LEFT STOOL
11 RIGHT STOOL
5/16
UPPER DK REF 7 OR 9
TEMPLATE AT INSTL - CUT TO SUIT
LONG BHD 21'-0 OFF CL SHIP (S)
TEMPLATE AT INSTL - CUT TO SUIT
INBD
EL LKG FWD
4 UPPER STOOL LOC AT INSTALLATION
5/16
9 STAPLE
7 OVAL NICO PRESS SLEEVE FOR 1/8 DIA W.R
8 1/8 DIA X 7 X 19 (CRES) WIRE ROPE
FWD
7
13 UPPER STWG CLIP
1/8
6 KEY
12 LOWER STWG CLIP
1/8
11 (NEAR)
10 (FAR)
TEMPLATE AT INSTALLATION CUT TO SUIT
END EL

DETAIL 4-B
STOWAGE OF PINTLE NUT WRENCH
SCALE: 1-1/2 = 1 FT



STOWAGE OF THE 12 POINT BOX END WRENCH DET 3-A
AFTER SIDE OF THE AFTER DECKHOUSE
21'-0
21'-0
19
21
23
CL SHIP
FWD
23
STOWAGE OF THE PINTLE NUT WRENCH DET 4-B

DETAIL 2-C
PLAN VIEW UPPER DECK AT THE AFTER DECKHOUSE FR 23 P&S SHOWING LOC OF WRENCH STWG
SCALE: 1/8 = 1 FT



4 UPPER STOOL LOC AT INSTALLATION
5/16
FAR 3
NEAR 2
TEMPLATE AT INSTALLATION CUT TO SUIT
2 LEFT STOOL
5/16
END EL
14 1-3/4 DIA HEX HD BOLT STL ZINC PLTD
15 STD WASHER - STL ZINC PLTD FOR 1-3/4 DIA BOLT
AFTER SIDE OF DKHSE FR 23 REF 10
1 12 POINT BOX END WRENCH
3 RIGHT STOOL
UPPER DK REF 7 OR 9
45°
45°
TEMPLATE AT INSTALLATION CUT TO SUIT
LONG BHD 21'-0 OFF CL OF SHIP (P) (REF)
EL LKG FWD
INBD

DETAIL 3-A
STWG OF 12 POINT WRENCH
SCALE: 1-1/2 = 1 FT

REVISIONS

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHD	OWNER DATE	OWNER APPD
A	-	INITIAL ISSUE				

RWH 3/4/77

AUTHORITY:

A. DET SPEC SECT 2.
B. MEMOS FROM E-13 DEPT DATED 4-13-76 & 5-18-76.

GENERAL NOTES:

1. FOR GENERAL NOTES PERTAINING TO HULL STRUCTURE - SEE REF 1.
2. WELDING TO BE IN ACCORDANCE WITH APPLICABLE NOTES IN REF 2.
3. PAINTING TO BE IN ACCORDANCE WITH APPLICABLE NOTES IN REF 3 OR 4.
4. PARTS IN BODY OF DWG ORDERED IN REF 5.
5. PARTS IN BODY OF DWG DETAILED ON REF 6.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS SHELL LTR 1337V DTD 1-17-77 ZAPATA LTR DTD 2-16-77	ABS
	USCG

	NO.	REFERENCES	DWG NO.
613C & 614C	10	DK HOUSE ENCL FR 23 & 21	1270-568
615C	9	UPPER DK PLTG & FRMG AFT FR 23-1/2	1160-33
613C & 614C	8	UPPER DK PLTG & FRMG AFT FR 23-1/2 (STBD)	1160-45
613C & 614C	7	UPPER DK PLTG & FRMG AFT FR 23-1/2 (PORT)	1160-40
	6	WRENCHES - DETAIL	1800-79
	5	WRENCHES - SHIP INSTALLATION L/M	1800-78
615C	4	PAINTING SCHEDULE	8300-41
613C & 614C	3	PAINTING SCHEDULE	8300-40
	2	N.N. WELDING PROCEDURE	CSW-2
	1	GENERAL NOTES PERTAINING TO HULL STRUCTURE	0100-749

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
HULL DESIGN DEPT.

SCALE AS NOTED = 1 FT
DRAWN C.R. PELLETIER
CHECKED T.L. MARKHAM
SECT MGR W.K. Bradshaw
DATE COMPL 12-8-76
EXAMINED
AUTHORIZED
DATE 12-9-76
TECH APPROVAL NOT REQD
CSD APPROVAL

390,000 DWT TANKER
WRENCHES - SHIP INSTALLATION

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO. 309 - 311
DWG NO. 1800-77
REV A
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS YES
GROUPING YES
REMARKS NEW DWG FOR ISSUE
DATE 3-1-77
SIGNED W.K. Bradshaw

GROUP:
MC NO 176

FOR GROUP SEE DWG 1800-79

1800-77

SEPT. '80
FRAME 1
10X

1800-78
D-31
E.R.B.

REPRODUCTION OFFICE	
YARD PRINTS	YES
REMARKS	NEW DWG FOR ISSUE
GROUPING	YES
DATE	3-1-77
SIGNED	W.K. Bradshaw

YARD PRINTS / ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS					
REV.	A	A	A	A	
SHEET	1	2	3	4	

GROUP
MC NO. 172

PC 11-29-76

NNS&DDCo HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C	311		
614C	310		
613C	309	T11-S-116a	

DWG. REV. — HULL APPLIC.

REV.	613	614	615
A	YES	YES	YES

APPROVALS
OWNERS SHELL LTR 1337V DTD 1-11-77
ZAPATA LTR DTD 2-16-77
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
DEPT. HULL DESIGN

FOR GROUP SEE DWG. 1800-79

SCALE NONE =1 Ft.
DRAWN C.R. PELLETIER
CHECKED T.L. MARKHAM
SECT. MGR. W.K. Bradshaw
DATE COMPL. 12-8-76
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 12-9-76
TECH. APPROVAL NOT REQD
CSD APPROVAL R. L. Harrington

TITLE
390,000 DWT TANKER
WRENCHES - SHIP INSTALLATION - L/M

TYPE OF DWG. WORKING DRAWING
DWG. NO. 1800-78
REV A
SHEET NO. 1 OF 4

GROUPED BY / CHK. — DATES PART / COMP. — HULL / GROUP NO. / KEY

E.R.B. 1800-78

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D.	OWNER DATE	OWNER APP'D.
A		INITIAL ISSUE				

3-4-77 RWH

NO.	REFERENCES	DWG. NO.
3	GENERAL NOTES PERTAINING TO HULL STRUCTURE	0100-749
2	WRENCHES - DETAILS	1800-79
1	WRENCHES - SHIP INSTALLATION	1800-77

HULL NO. 613C-615C DWG. NO. 1800-78 SHEET 2 OF 4

AUTHORITY:
A. DET SPEC SECT 2.

GENERAL NOTES:
1. FOR GENERAL NOTES PERTAINING TO HULL STRUCTURE SEE REF 3.
2. PARTS ON SH 4 THIS DWG ARE DETAILED ON REF 2.
3. FOR SHIP INSTALLATION OF PARTS ORDERED ON THIS DWG SEE REF 1.

HULL NO. 613C-615C DWG. NO. 1800-78 SHEET 3 OF 4

LIST OF MATERIAL & OUTFITTING GROUPS

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	1	12 POINT BOX END WRENCH - PT 1 REF 2	615C MFG GR 1800-79-1 S-1 L-1	ST-0B	
		2	1	2	LEFT STOOL PT 2 REF 2	S-1 L-2		
		3	1	3	RIGHT STOOL PT 3 REF 2	S-1 L-9		
		4	2	4	UPPER STOOL PT 4 REF 2	S-1 L-16		
		5	1	5	PINTLE NUT WRENCH PT 5 REF 2	S-1 L-17		
		6	1	6	KEY PT 6 REF 2	S-2 L-1		
		7	2	7	OVAL NICO PRESS SLEEVE FOR 1/8 DWR PT 7 REF 2	S-2 L-5		
		8	1	8	1/8 DIA X 7X19 W.R (CRES) PT 8 REF 2	S-2 L-6		
		9	1	9	STAPLE PT 9 REF 2	S-2 L-2		
		10	1	10	LEFT STOOL PT 10 REF 2	S-2 L-7		
		11	1	11	RIGHT STOOL PT 11 REF 2	S-2 L-14		
		12	1	12	LOWER STWG CLIP PT 12 REF 2	S-3 L-2		
		13	1	13	UPPER STWG CLIP PT 13 REF 2	S-3 L-6		
		14	1	14	1-3/4 DIA HEX HD BOLT PT 14 REF 2	S-3 L-7		
		15	2	15	1-3/4 STD WASHER STL ZINC PLTD	21-51-128		
		16	1	16	1-3/4 DIA HEX HD BOLT PT 15 REF 2	S-3 L-8 613C MFG GR 1800-79-1		
		17						
		18						

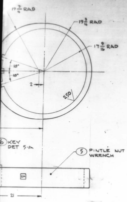
REMARKS -

SERVICE -

OB-190
GROUP NO. 1800 - 1601 - 1001

APPLICABLE HULLS 613C 614C 615C
DWG NO. 1800-78 SHEET 4 REV. A

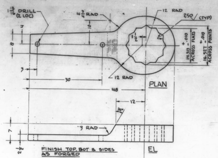
1800-78
MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME
8X


19 3/4 RAD
19 3/4 RAD
17 9/16 RAD
18°
18°
2
250
6 KEY DET 5-A
5 PINTLE NUT WRENCH
5A
21

AS FORGED
& EDGES

AIL 5-C
NUT WRENCH
E: 1-1/2 = 1 FT

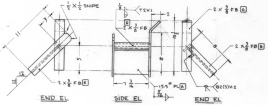
NCH


1 13/16 DRILL (2 LOC)
4 3/4 RAD
12 RAD
250 (TYP)
10
4
8
1 1/2
14.313 +/- .010 ACROSS FLATS
16.527 +/- .010 ACROSS POINTS
3
30
12 RAD
48
PLAN
12
30°
3 RAD
7
2 1/2
EL

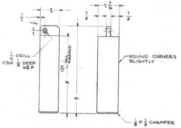
FINISH TOP, BOT & SIDES AS FORGED

BREAK ALL SHARP CORNERS AND EDGES

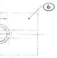
DETAIL 4-C
① 12 POINT BOX END WRENCH
SCALE: 1-1/2 = 1 FT


1/2 X 1/2 SNIPE
11
3
5
12
12
2 X 3/8 FB E
END EL
1/8
T2V.1
D
2 X 3/8 FB
2
10 1/2
8
7 3/16
15.3# PL A
5/16
SIDE EL
2 X 3/8 FB C
8
2 X 3/8 FB B
B2(S)V.2
END EL

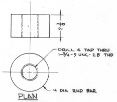
DETAIL 4-B (AS SHOWN)
② LEFT STOOL
DETAIL 4-B1 SIM TO OPP HAND
③ RIGHT STOOL
SCALE: 3 = 1 FT


1/2
2
1/2
2 7/16
7/8
7/8
1/4 DRILL CSK 1/8 DEEP N&F
125 ALL AROUND
8
9
ROUND CORNERS SLIGHTLY
1/8 X 1/8 CHAMFER

DETAIL 5-A
⑥ KEY
SCALE: 6 = 1 FT



⑦ OVAL NICOPRESS SLEEVE FOR 1/8 DIA W.R


2 3/8
DRILL & TAP THRU 1-3/4-5 UNC-2B THD
4 DIA RND BAR

PLAN
DETAIL 4-A
④ UPPER STOOL
SCALE: 6 = 1 FT

LIST OF MATERIAL

FOR ORDERS SEE REF 8

PART NO	NAME OF PART	MATERIAL	ZONE	REFERENCE DWG NO	REMARKS
1	12 POINT BOX END WRENCH	FORGED STL	4-C		
2	LEFT STOOL	STL	4-B		
3	RIGHT STOOL	STL	4-B1		
4	UPPER STOOL	STL	4-A		
5	PINTLE NUT WRENCH	FORGED STL	5-C		
6	KEY	CRES CL304	5-A		COND A
7	OVAL NICOPRESS SLEEVE FOR 1/8 DIA W.R	ZINC PLTD COPPER	6-A		SIM TO NAT TEL SUPPLY CO TYPE 28-3-M
8	1/8 DIA 7X19 WIRE ROPE	CRES	6-A		SIM TO HAZARD KORODLESS TYPE 304
9	STAPLE	STEEL	6-A		
10	LEFT STOOL	STL	7-C		
11	RIGHT STOOL	STL	7-C1		
12	LOWER STWG CLIP	STL	7-A		
13	UPPER STWG CLIP	STL	7-A1		
14	1-3/4 HEX HD BOLT LG=4-5/8	STL	–		THD=1-3/4-5UNC-2A LG=3-3/4
15	1-3/4 HEX HD BOLT LG=5-1/8	STL	—		THD=1-3/4-5UNC-2A LG=3-3/4

RWH 3/4/77

REVISIONS

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHO	OWNER DATE	OWNER APPD
A		INITIAL ISSUE				

AUTHORITY:
A. DETAIL SPEC SECT 2.
B. MEMOS FROM DEPT E-13 DATED 4-13-76 & 5-18-76.

GENERAL NOTES:
1. FOR GENERAL NOTES PERTAINING TO HULL STRUCTURE SEE REF 1.
2. WELDING TO BE IN ACCORDANCE WITH APPLICABLE NOTES IN REF 2.
3. FOR INSTALLING WRENCHES & STOWAGES ON SHIP SEE REF 7.
4. WRENCHES & STOWAGES ORDERED IN REF 8.
5. 12-POINT BOX WRENCH, PT 1, DEVELOPED TO SUIT RUDDER STOCK PALM BOLTS ON REF 5.
6. WRENCH, PT 5, DEVELOPED TO SUIT PINTLE NUT ON REF 6.
7. MACHINE SURFACE SYMBOLS & CONTROL NUMBERS ARE IN ACCORDANCE WITH ASA B46.1.
8. PAINTING TO BE IN ACCORDANCE WITH APPLICABLE NOTES IN REF 3 OR 4.

PC 11-29-76

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING YES
REMARKS NEW DWG FOR ISSUE
DATE 3-1-77 SIGNED W.K. Bradshaw

GROUP:
MC NO. 172

1800-79-1 GMADD MFG RUDDER NUT WRENCH STOWAGE

DWG. REV – HULL APPLIC
REV A

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS
OWNERS SHELL LTR 1357V DTD 1-11-77
ZAPATA LTR DTD 2-16-77
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
HULL DESIGN DEPT.

SCALE AS NOTED = 1 FT
DRAWN C.R. PELLETIER
CHECKED T. L. MARKHAM
SECT MGR W.K. Bradshaw
DATE COMPL. 12-8-76
EXAMINED
AUTHORIZED
DATE 12-9-76
TECH APPROVAL NOT REQD
C S D APPROVAL R.L. Harrington

390,000 DWT TANKER
WRENCHES - DETAILS

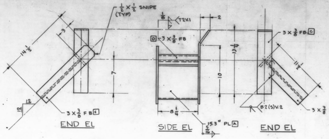
USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO. 309-311
DWG NO. 1800-79
REV A
SHEET NO. 1 OF 1

NO.	REFERENCES	DWG NO.
8	WRENCHES - SHIP INSTALLATION - L/M	1800-78
7	WRENCHES - SHIP INSTALLATION	1800-77
6	RUDDER SECTIONS	1310-71
5	RUDDER STOCK	1310-72
4	PAINTING SCHEDULE	8300-41
3	PAINTING SCHEDULE	8300-40
2	N N WELDING PROCEDURE	CSW-2
1	GENERAL NOTES PERTAINING TO HULL STRUCTURE	0100-749

615C – (ref 4)
613C & 614C – (ref 3)

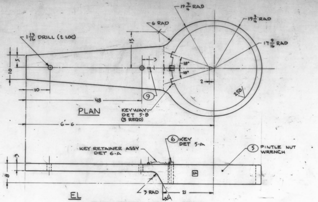
1800-79

SEPT. '80
FRAME 1
10X



½ X ½ SNIPE (TYP)
14½
3
7
12
12
3 X ⅜ FB E
END EL
⅛ T2V.1
2
D 3 X ⅜ FB
13¼
10
8¼
15.3# PL A
5/16
SIDE EL
3 X ⅜ FB C
11½
B2(S)V.2
3 X ⅜ FB B
END EL

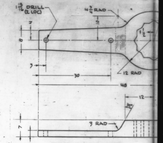
DETAIL 7-C (AS SHOWN)
⑩ LEFT STOOL
DETAIL 7-C1 (SIM TO OPP HAND)
⑪ RIGHT STOOL
SCALE: 3=1 FT



1 13/16 DRILL (2 LOC)
6 RAD
19¾ RAD
19¾ RAD
17 9/16 RAD
15
5
10
10
3
18°
18°
2
250
⑨
48
PLAN
KEYWAY DET 5-B (3 REQD)
6'-6
⑥ KEY DET 5-A
KEY RETAINER ASSY DET 6-A
⑤ PINTLE NUT WRENCH
3
8
5A
3 RAD
30°
21
EL

FINISH TOP, BOT & SIDES AS FORGED
BREAK ALL SHARP CORNERS & EDGES

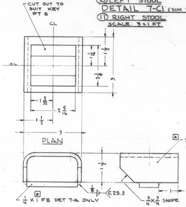
DETAIL 5-C
PINTLE NUT WRENCH
SCALE: 1-½=1 FT



1 13/16 DRILL (2 LOC)
4¾ RAD
4
8
10
1½
3
12 RAD
30
48
12
30°
3 RAD
7
2½

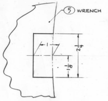
FINISH TOP, BOT & SIDES AS FORGED
BREAK ALL SHARP CORNERS AND EDGES

DETAIL 4-C
① 12 POINT BOX END WRENCH
SCALE: 1-½=1 FT



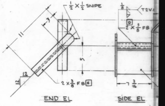
CUT OUT TO SUIT KEY PT 6
CL
CL
1 1/16
1½
2⅛
3
1 5/32
2 5/16
1½
3
PLAN
A 3 X 3/16 FLAT STRIP FLG ENDS
1½
⅛ C25.2
1
B ¼ X 1 FB DET 7-A ONLY
¾ X ¾ SNIPE
FRONT EL
SIDE EL

DETAIL 7-A (AS SHOWN)
⑫ LOWER STWG CLIP
DETAIL 7-A1 (SIM EXCEPT AS NOTED)
⑬ UPPER STWG CLIP
SCALE: 12=1 FT



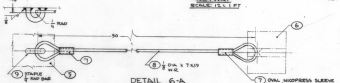
⑤ WRENCH
1
2¼
1⅛

DETAIL 5-B
KEYWAY
SCALE: 12=1 FT



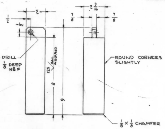
½ X ½ SNIPE
3
11
12
12
2 X ⅜ FB E
5
⅛ T2V.1
D 2 X ⅜ FB
7 3/16
END EL
SIDE EL

DETAIL 4-B
② LEFT STOO
DETAIL 4-B1
③ RIGHT STOO
SCALE: 3=1 FT



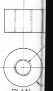
½
⅛
¼ RAD
30
⑥
⑦
⑧ ⅛ DIA X 7X19 W.R
⑨ STAPLE ¼ RND BAR
⑤
⑦ OVAL NICOPRESS SLEEVE FOR ⅛ DIA. W.R

DETAIL 6-A
KEY RETAINER ASSY
SCALE: 12=1 FT



2
½
½
2 3/16
⅞
⅞
¼ DRILL CSK ⅛ DEEP N&F
125 ALL AROUND
8
9
ROUND CORNERS SLIGHTLY
⅛ X ⅛ CHAMFER

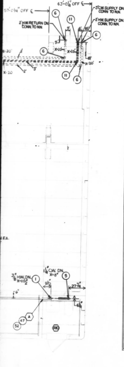
DETAIL 5-A
⑥ KEY
SCALE: 6=1 FT

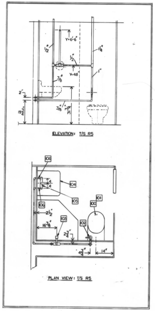


PLAN
DETAIL
④ UPPER
SCALE: 6

MICRO-MASTER 105 mm
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 2
10X

1800-79


57'-0¼" OFF ℄
63'-0⅛" OFF ℄
3"C.W. SUPPLY DN. CONN. TO NN.
2"H.W. RETURN DN. CONN. TO NN.
2"H.W. SUPPLY DN. CONN. TO NN.
X-20
3/8" H.W. DN.
1⅛" C.W. DN.
27¾"
6
11
5
47
52



LIST OF MATERIAL

PIPE LIST

REV	ITEM	PART NO	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	P-1	PL-500-02	3/8"	TUBE SEAMLESS	COPPER	ASTM B88	TYPE 'K' HARD DRAWN
	P-2	PL- -03	1/2"				
	P-3	PL- -05	3/4"				
	P-4	PL- -06	1"				
	P-5	PL- -07	1¼"				
	P-6	PL- -09	2"				
	P-7	PL- -11	3"				
	P-8	PL-500-52	3/8"	TUBE SEAMLESS	COPPER		TYPE K(SOFT)

MATERIAL LIST

REV	ITEM	PART NO	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	1	PL-537-04	3/8"	ELBOW 90° CXC	WROT COPPER	ANSI B16.22	
	2	PL-537-06	1/2"				
	3	PL-537-12	3/4"				
	4	PL-537-16	1"				
	5	PL-537-21	1¼"				
	6	PL-537-25	2"				
	7	PL-568-01	3/8"	ELBOW 90° CXF	BRONZE	ANSI B16.18	
	8	PL-568-02	1/2"				
	9	PL-568-05	3/4"				
	10	PL-568-09	1"				
	11	PL-537-28	3"	ELBOW 90° CXC	WROT COPPER	ANSI B16.22	
	12	PL-546-21	3/8"X3/8"X3/8"	TEE CXCXC			
	13	PL-546-35	1/2X1/2X1/2				
	14	PL-547-51	2"X 1"X 2"				
	15	PL-547-02	1¼X1"X 1"				
	16	PL-546-42	1/2X3/8X3/8				
	17	PL-546-63	3/4X3/4X3/8				
	18	PL-546-62	3/4X3/4X1/2				
	19	PL-546-60	3/4X3/4X1"				
	20	PL-546-80	1"X1"X1/2				
	21	PL-546-78	1"X1"X3/4				
	22	PL-546-88	1"X3/4X1/2				
	23	PL-546-90	1"X1/2X1"				
	24	PL-546-92	1"X1/2X 1/2				
	25	PL-546-86	1"X3/4 X3/4				
	26	PL-546-99	1¼X1¼X3/8				
	27	PL-546-97	1¼X1¼X3/4				
	28	PL-546-96	1¼X1¼X1"				
	29	PL-547-07	1¼X3/4X3/4				
	30	PL-547-09	1¼X1/2X1¼				
	31	PL-547-04	1¼X1"X1/2				
	32	PL-546-94	1¼X1¼X2"				
	33	PL-547-32	2"X 2"X 2"				
	34	PL-546-81	1"X 1"X3/8				
	35	PL-547-38	2"X2"X1/2				
	36	PL-547-37	2"X2"X 3/4				
	37	PL-547-36	2"X2"X 1"				
	38	PL-547-48	2"X1¼X 1"				
	39	PL-547-75	3"X 3"X 2"				
	40	PL-070-02	2"	STOP VALVE, GATE	BRONZE		NIBCO OR EQUAL
	41	PL-556-04	1/2"X3/8"	REDUCER	WROT COPPER	ANSI B16.22	
	42	PL-560-13	1/2"	ADAPTER CXF			
	43	PL-539-08	1¼"	ELBOW FTGxC			
	44	PL-629-03	3/8"	PLUG SOLID	CAST BRONZE	ANSI B16.18	
	45	PL-556-10	3/4X1/2	REDUCER	WROT COPPER	ANSI B16.22	
	46	PL-149-58	3/4"	SLEEVE	STEEL GR1050		1 3/8" O.D.X.247 W.X 3"LG.
	47	PL-149-53	3/8"				1" O.D.X.247 W.X 3"LG.
	48	PL-149-67	2"				2 5/8 O.D.X.247 W.X 3"LG.
	49	PL-149-71	3"				3 5/8" O.D.X.247 W.X 3"LG.
	50	PL-149-61	1"				1 5/8" O.D.X.247 W.X 3"LG.
	51	PL-149-55	1/2"				1 1/8" O.D.X.247 W.X 3"LG.
	52	PL-149-63	1¼"				1 7/8" O.D.X.247 W.X 3"LG.
	53	PL-149-56	3/8"				1 1/8" O.D.X.222 W.X 3"LG.
	54	PL-546-39	1/2"X1/2"X3/8"	TEE CXCXC	WROT COPPER	ANSI B16.22	
	55	PL-546-71	3/4X3/8X3/4				
	56	PL-546-91	1"X1/2X3/4				
	57	PL-546-69	3/4X1/2X1/2				
	58	PL-560-21	1"	ADAPTER CXF			
	59	PL-539-10	2"	ELBOW 90° FTGXC			
	60	PL-546-68	3/4X1/2X3/4	TEE CXCXC			
	61	PL-547-05	1¼X3/4X1¼				
	62	PL-547-47	2"X1¼X1¼				

FOR CONTINUATION SEE ZONE 1G.

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHO	OWNER DATE	OWNER APPD
O		SUBMITTED FOR APPROVAL	3-21-77	RLH	2-28-77 2-16-77	SHELL ZAPATA
A		1. INITIAL ISSUE				
		2. T/S 2-5 C.W. & H.W. LINES REV.				
		3. 11'-0" OFF ℄ PORT FR. H2 H.W. & C.W. REVISED.				
		4. H.W. & C.W. LOOP IN GALLEY OVERHEAD REVISED.				
		5. H.W. & C.W. PORT OF ℄ REV. PER ENG. DESIGN & DEVELOPMENT 6-6-77 R.W.M.				
		6. 2" HW & 3" CW LINES ADDED UNDER CAMBER DECK TO CONNECT TO N.N. - FWD. STBD. SIDE 6-8-77 R.W.M.	6-29-77	RLH		
B		1. LAUNDRY ROOM; ½" C.W. RUNNING AFT & DN. TO N.N. DELETED. 6-16-77 R.W.M.				
		2. H & C HORIZ. RUN AT ℄ FR. H10 ADDED DIM. "COLD 9"7 FWD FR. H10 HOT 6" AFT FR H10. 6-22-77 R.W.M.				
		3. 24'-0¼" STBD. ℄ FR H2 "X" REV. ON PIPING UNDER CAMBER DK. 6-24-77 R.W.M.				
		4. 9'-3" STBD. ℄ FR-H13 X=8" ON C.W. WAS X=15" (2) ITEM 5 DELETED				
		5. SECTION 9-A G15 GALLEY 14'-6" PORT ℄ 3'-5⅝" DIM. WAS 5'-4¼" & 2⅜" DIM. WAS 3".				
		6. DET. 13-A (1) ITEM 157 DELETED.				
		7. DET. 13-A ITEM 180 WAS 162; 180 ADDED TO PARTS LIST.				
		8. 2'-6" INBOARD 37'-0½" PORT ℄ 16" AFT. FR. H7 ITEM 14 WAS 33 ITEM 15 WAS 28.				
		9. 5'-0¼" PORT ℄ FR. H7 ITEM 59 ADDED; DET. 7-C REV. TO AGREE				
		10. 36'-0½" PORT ℄ 4' AFT. H9 (2) ITEM 4 WAS (2) ITEM 3.				
		11. DET. 15-03 ITEM 2, 8 & 42 WAS 1, 7 & 43.				
		12. DET. 15-D2 (2) ITEM 42 WAS (2) 43.				
		13. DET. 14-C (2) ITEM 147 DELETED 7-13-77 R.W.M.				
		14. 27'-6" STBD. ℄ UNDER CAMBER DK. 3" C.W. SUPPLY TO N.N. X=12" WAS X=4". 7-19-77 R.W.M.				
		15. ITEMS 181, 182, 183 & 184 ADDED.				
		16. DET. 14-C ITEM 182 WAS 145.				
		17. DET. 7-C ITEMS 183 & 184 ADDED. RUBBER HOSE & CLAMP.				
		18. GALLEY PIPING ITEM 181 UNIONS ADDED TO FAUCET SUPPLIES. 7-20-77 R.W.M.				
		19. APPROX. 4'-0" STBD. ℄ FR H9 ½" C.W. & H.W. TO FILTER CLEANING SINK ON 'A' DK. ADDED. PARTS LIST REV. TO SUIT. 8-5-77 R.W.M.				
		20 ADDED H & C SUPPLY TO GALLEY & UNDER CAM. DK PORT SIDE HULL 615 ONLY.				
		21 2" H.R.W UNDER CAM. DK REV LOC TO 6' AFT H 2				
		22. 2" H.W. LINE, 30" INBD. 38'-0½" BHD. PORT. "X" DIM. WAS 16" B IN WAY OF H-15 GIRDER.				
		23. ½" C.W. LINE TO SVC. SK. 12" FWD. H-13, INBD. 38'-0½" BHD. PORT. "X" DIM. WAS 8 13". 8-23-77 D.L.				
		24 REV Pc No FROM 5 TO 42 & 6 TO 59 BTWN H7 & H9 FROM 3' TO 17' OFF ℄ P				
		25 DET 10-D REV ITEM # TO 116				
		26 REV LOC & Y DIM OF H & C BTWN H1 & H3, 12" TO 63' OFF ℄ STD.				
		27. REV LOC OF H & C BTWN H16 & H17 & 44' TO 61' OFF ℄ STD.				
		28. REV. "X" DIM. OF H. & C. B'TWN. H1 & H2, 27'-6" TO 40'-8" OFF ℄ STBD.				
	A-5	29. REV. GALLEY H.W. RUN TO 20" IN'BD. 10'-6", STBD. BHD; "X" DIMS. REV'D. TO SUIT.				
	A-5	30. REV. GALLEY C.W. RUN TO 14" IN'BD. 10'-6", STBD. BHD., "X" DIMS. REV'D. TO SUIT.				
	C-6	31. 11'-1" PORT ℄, 12" FWD. H-3, C.W. RUN TO GARBAGE COMPACTOR RM. HOSE BIB REV'D., "X" DIM. WAS 8", DET'LS. 10A & 10B REV'D. TO SUIT.				
	A-6	32. PT. NOS. & DIMS. ADDED TO GAYLORD HOOD WASH DOWN PIPING, DET'L. 12A REV'D. TO SUIT.				
	B-7 B-8	33. LAUNDRY, H. & C.W. PIPING TO WASHING MACH., "X" DIM. WAS 19".				
		34. PC. 185 & /OR 186 ADDED TO DET'LS. 14C, 15B & 15-D1.				
	A-16	35. PCS. 63 THRU 67, 185 & 186 ADDED TO L/M.				
	B18	36. PC. 149 IN L/M WAS 3/8".				
		37. Pc No 43 REV FROM 3/8 ADAPTER TO 1¼ ELBOW FTGxC				
	B-7	38. 39'-6" OFF ℄ FR H11; PIPING TO SERVICE SINK REV. TO ALLOW FOR EASIER SERVICE OF PIPING IN CLG. GEAR LKR.				
	C-8	39. DETAIL 8-B REV. TO AGREE W/REV. 38.				
	D-14	40. DETAIL 15-D1 REV. PER CARTERET REQUEST, PARTS LIST REV. TO AGREE W/ITEM.				
		41. 24'-0¼" STBD. ℄ FR H6, 3/8 H.W. LINE REV.	4-3-78	A.C.		
		42 ADDED SECT 7-A				
C		1. ITEM 193 ADDED				
		2. DET 12-A ITEM 167 WAS 65 & ITEM 174 WAS 67				
		3. ITEM 63 THRU 67 DELETED				
		4. ITEMS 70, 71 & 72 ADDED				
	6B 10D 2A	5. ADDED SINK SUPPLY IN NIGHT SERVING AREA OF GALLEY TO SUIT OWNERS REQUEST, J.O. 2040-L-1.				
		6. DET. 10-D MODIFIED & REF. 7 ADDED.				

REFERENCES

NO.	REFERENCES	DWG NO.
©7	PIPING ARR POT WTR SYS IN ER L/M	2350-1354
6	LAUNDRIES ARRGT & DETAILS	7600-459
5	TYP PIPING INSTALL DET & GEN NOTES	2502-140
4	POTABLE WATER SYS. ARRGT. A DECK	2350-1347
3	PLUMBING FIXTURE LIST	2502-138
2	DIAG. POTABLE WATER SYS. LIST	2350-1343
1	DIAG. POTABLE WATER SYS. ARRGT.	2350-1342

AUTHORITY:

GENERAL NOTES:

1. FOR GENERAL NOTES SEE REF. 5
2. JOB TO TEMPLATE ALL WORK.
3. FOR INSULATION REQUIREMENTS SEE REF. 5
4. FOR MATERIAL INDICATED THUS ☐ SEE REF. 3
5. ALL PENETRATIONS THRU GIRDERS, STEEL BULKHDS., DECKS AND DRAFT STOPS ARE INDICATED ⬡ THUS SEE REF. 5 FOR PROPER DETAILS.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615	311	
614	310	
613	309	

APPROVALS

OWNERS SHELL APPROVAL DATED 2-28-77 ZAPATA APPROVAL DATED 2-16-77		ABS	N.R.
NEWPORT NEWS - APPROVAL LTR. 63C/C2350 DATED 3-21-77		USCG	N.R.
U.S.P.H.	APVL. LTR. DATED 1/17/77		

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689
DEPT.

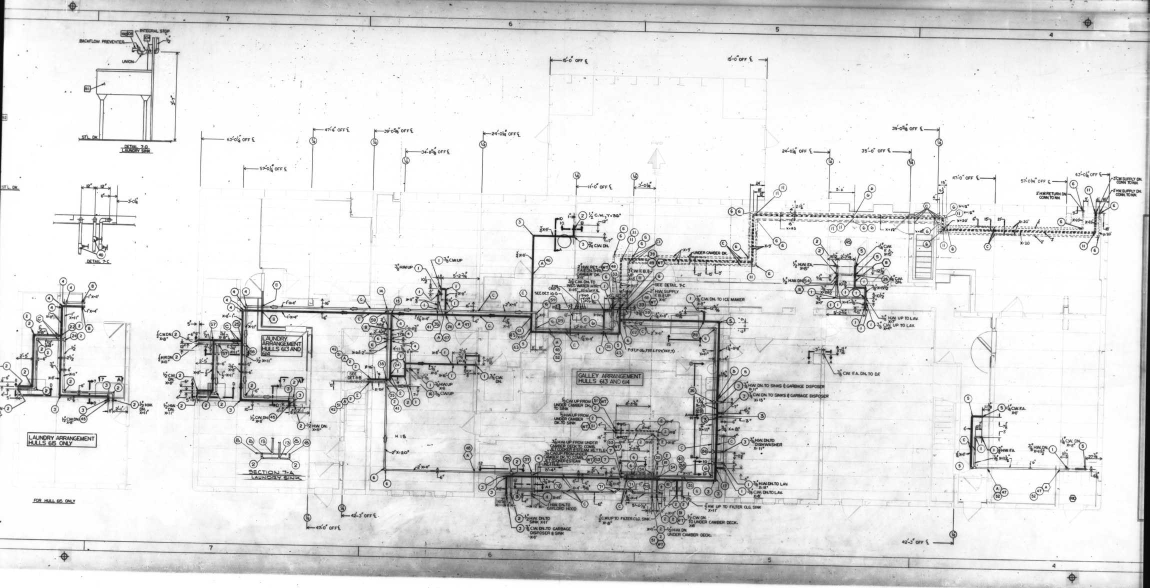
HOPEMAN BROTHERS INC.
WAYNESBORO, VA.
H.B. DWG NO.
SHT. OF.

SCALE 3/8" = 1 FT
DRAWN
CHECKED A.H. Salminen
SECT MGR J. T. Cogute
DATE COMPL. 1-10-77
EXAMINED —
AUTHORIZED A. CONLEY
DATE 6-30-77
TECH APPROVAL
C S D APPROVAL R.L. HARRINGTON

POTABLE WATER SYS. ARRGT.
CAMBER DECK

U S M A DESIGN T11-S-116A
U S M A DWG NO.
HULL NO.
DWG NO. 2350-1344
REV C
SHEET NO. 1 OF 1

2350-1344
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
10X
FRAME 1


DETAIL 7-D
LAUNDRY SINK
BACKFLOW PREVENTER
INTEGRAL STOP
UNION
ST'L DK
DETAIL 7-C
LAUNDRY ARRANGEMENT HULLS 615 ONLY
FOR HULL 615 ONLY
LAUNDRY ARRANGEMENT HULLS 613 AND 614
SECTION 7-A
LAUNDRY SINK
GALLEY ARRANGEMENT HULLS 613 AND 614
FWD
UNDER CAMBER DK.
SEE DETAIL 7-C
SEE DET. 10-D
SEE DET. 8-B
7
6
5
4
15'-0" OFF ℄
63'-0¼" OFF ℄
57'-0¼" OFF ℄
47'-6" OFF ℄
39'-0⅝" OFF ℄
34'-8⅝" OFF ℄
24'-0¼" OFF ℄
11'-0" OFF ℄
35'-0" OFF ℄
47'-0" OFF ℄
42'-3" OFF ℄
47'-0" OFF ℄
3" C.W. SUPPLY DN. CONN. TO NN.
2" H.W. RETURN DN. CONN. TO NN.
2" H.W. SUPPLY DN. CONN. TO NN.
1½ C.W. DN. TO ICE MAKER
H.W. DN. TO SINKS & GARBAGE DISPOSER
C.W. DN. TO SINKS & GARBAGE DISPOSER
H.W. DN. TO DISHWASHER
H.W. DN. TO LAV.
C.W. DN. TO LAV.
½ H.W. UP TO FILTER CLG. SINK
½ C.W. UP TO FILTER CLG. SINK
½ C.W. DN. TO UNDER CAMBER DECK
½ H.W. DN. UNDER CAMBER DECK
H.W. DN. TO GAYLORD HOOD
½ H.W. DN. TO SINK
C.W. DN. TO GARBAGE DISPOSER & SINK
C.W. F.A. DN. TO DR.
H.W. UP TO LAV.
C.W. UP TO LAV.

2350-1344

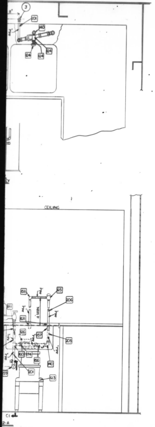
MICRO-MASTER 105 mm

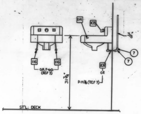
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

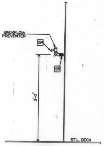
10X

FRAME 2

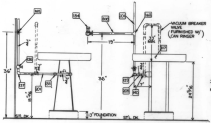

CEILING
C1
2-A
PARATION AREA


ST'L. DECK
116
116
114
105
7
7
108

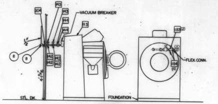
DETAIL 10-D ⓒ
LAVATORY (GALLEY)


BACKFLOW PREVENTER
134
135
3'-0"
ST'L. DECK

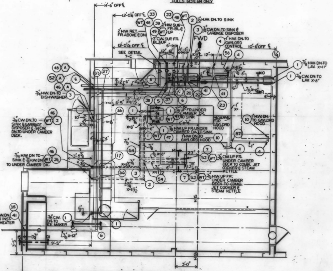
DETAIL 10-B
HOSE BIB


VACUUM BREAKER VALVE (FURNISHED W/ CAN RINSER)
19"
33" MIN.
36"
36"
3" FOUNDATION
ST'L. DK.

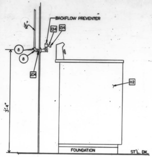
DETAIL 10-A
CAN RINSER AND STERILIZER


VACUUM BREAKER
FLEX. CONN.
FOUNDATION
ST'L. DK.

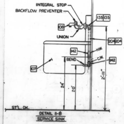
DETAIL 9-C
WASHING MACHINE
HULLS 613 & 614 ONLY


14'-6" OFF ℄
12'-0¼" OFF ℄
FWD
10'-6" OFF ℄
SEE DETAIL 7-C
¾" H.W. DN. TO DISHWASHER
¾" C.W. DN. TO SINK & GARBAGE DISPOSER & ¾" C.W. DN. TO UNDER CAMBER DECK.
⅜" H.W. DN. TO LAV. X=11"
⅜" C.W. DN. TO LAV. X=8"
10 ¾" H.W. DN. TO GAYLORD HOOD
RESERVE FOR GAYLORD HOOD
¾" C.W. UP FR. UNDER CAMBER DECK TO COMB. JET COOKER & STEAM KETTLE
¾" H.W. UP FR. UNDER CAMBER DECK TO COMB. JET COOKER & STEAM KETTLE
⅜" H.W. DN. TO INST. H.W. HEATER
⅜" C.W. DN. TO ICE MAKER
3'-0"
24'-0¼" OFF ℄

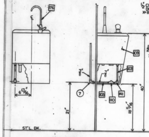
GALLEY ARRANGEMENT (615 ONLY)


BACKFLOW PREVENTER
112
3'-4"
FOUNDATION
ST'L. DK.

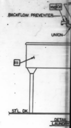
DETAIL 8-D
WASHING MACHINE

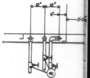

INTEGRAL STOP
BACKFLOW PREVENTER
UNION
BEND
H.W.
C.W.
2'-11"
ST'L. DK.

DETAIL 8-B
SERVICE SINK

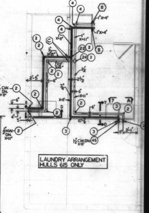


DETAIL 8-A
DRINKING FOUNTAIN


BACKFLOW PREVENTER
UNION
ST'L. DK.



DETAIL 7-C

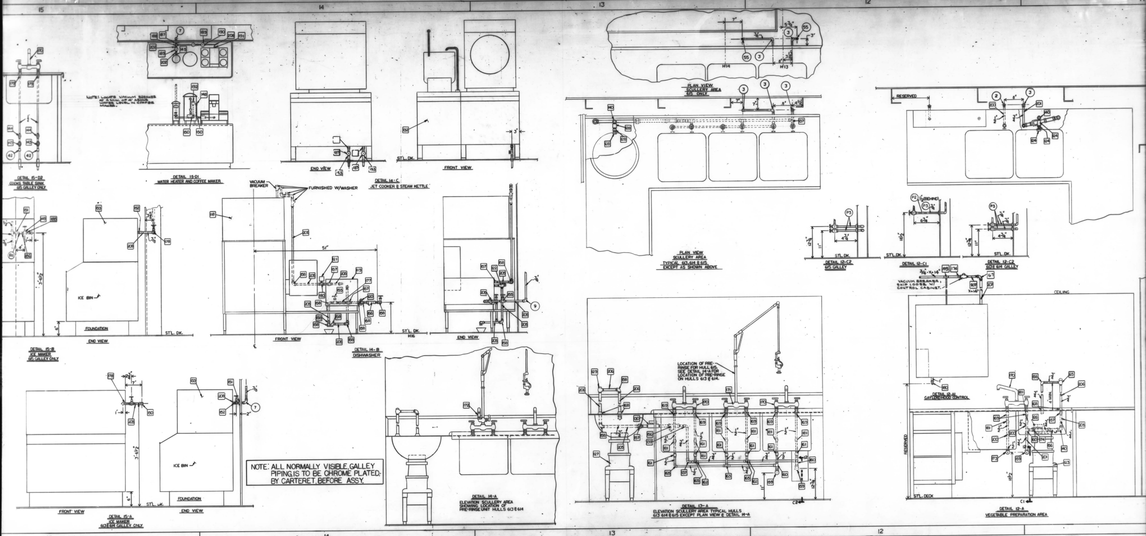

LAUNDRY ARRANGEMENT HULLS 615 ONLY

FOR HULL 615 ONLY

2350-1344

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
10X
FRAME 3


15
14
13
12
11
NOTE: LOCATE VACUUM BREAKER AT A MIN. OF 4" ABOVE WATER LEVEL IN COFFEE MAKER.
VACUUM BREAKER
FURNISHED W/WASHER
51"
ICE BIN
FOUNDATION
ST'L. DK.
H14
H13
H16
RESERVED
CEILING
VACUUM BREAKER, SHIP LOOSE W/ CONTROL CABINET.
LOCATION OF PRE-RINSE FOR HULL 615. SEE DETAIL 14-A FOR LOCATION OF PRE-RINSE ON HULLS 613 & 614.
ST'L. DECK
C1
C2

DETAIL 15-D2
COOKS TABLE SINK
615 GALLEY ONLY

DETAIL 15-D1
WATER HEATER AND COFFEE MAKER

END VIEW

FRONT VIEW

DETAIL 14-C
JET COOKER & STEAM KETTLE

PLAN VIEW
SCULLERY AREA
615 ONLY

PLAN VIEW
SCULLERY AREA
TYPICAL 613, 614 & 615
EXCEPT AS SHOWN ABOVE

DETAIL 12-C2
615 GALLEY

DETAIL 12-C1

DETAIL 12-C2
613 & 614 GALLEY

END VIEW

DETAIL 15-B
ICE MAKER
615 GALLEY ONLY

FRONT VIEW

DETAIL 14-B
DISHWASHER

END VIEW

DETAIL 12-A1
GAYLORD HOOD CONTROL

FRONT VIEW

END VIEW

DETAIL 15-A
ICE MAKER
613 & 614 GALLEY ONLY

NOTE: ALL NORMALLY VISIBLE GALLEY PIPING, IS TO BE CHROME PLATED BY CARTERET BEFORE ASSY.

DETAIL 14-A
ELEVATION SCULLERY AREA
SHOWING LOCATION OF
PRE-RINSE UNIT HULLS 613 & 614

DETAIL 13-A
ELEVATION SCULLERY AREA TYPICAL HULLS
613 614 & 615 EXCEPT PLAN VIEW & DETAIL 14-A

DETAIL 12-A
VEGETABLE PREPARATION AREA

2350-1344

SEPT. '80

10X

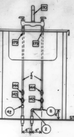
FRAME 4

MATERIAL LIST FIXTURES AND ACCESSORIES

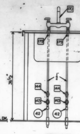
REV	ITEM	PART №	SIZE	DESCRIPTION	MATERIAL	SPEC.	REMARKS
	100	PL-001-01		WATER CLOSET			CRANE #3-446 OR EQUAL
	101	PL-002-01		WATER CLOSET SEAT			
	102	PL-071-01		FLUSH VALVE			SLOAN ROYAL #110-YO OR EQUAL
	103	PL-003-01		SHOWER HEAD AND VALVE			MOENTROL #BB-3170 OR EQUAL
	104	PL-004-01		LAVATORY			CRANE #1-195-S OR EQUAL
	105	PL-026-01		LAVATORY TRIM			CRANE #8-2177A OR EQUAL
	106	PL-025-01		LAVATORY SUPPLY			CRANE #8-5003 OR EQUAL
	107	PL-006-01		SERVICE SINK			ELKAY #2520 OR EQUAL
	108	PL-026-02		SERVICE & LAUNDRY SINK TRIM			CRANE #8-3757 OR EQUAL
	109	PL-008-01		DRINKING FOUNTAIN			EATON #WHA-12 OR EQUAL
	110	PL-025-02	3/8"	LOOSE KEY STOP STR.			CRANE #8-5111 OR EQUAL
	111	PL-007-01		LAUNDRY SINK			JUST #NSFB 242 OR EQUAL
	112	FF-680	WASHING MACHINE SEE DWG. NO. 7600-459 LAUNDRIES ARRGT. & DETAILS				
	113	FF-682	↓	↓ ↓ ↓ ↓ ↓	↓ ↓	↓	↓
	114	PL-004-02		LAVATORY			KOHLER #K-2753-A OR EQUAL
	115	PL-026-08		LAVATORY TRIM			KOHLER #K-8048-T OR EQUAL
	116	PL-025-05		LAVATORY SUPPLY			KOHLER #K-7606 OR EQUAL
	117	CAN RINSER AND STERILIZER—SEE DWG. #7500-387 GARBAGE COMPACTOR RM. ARRGT. AND DETAILS					
	118	DISHWASHER—SEE DWG. #7500-364 & #7500-384 GALLEY ARRGT. AND DETAILS					
	119	BOOSTER WATER HEATER—SEE DWG. #7500-364 & #7500-384 GALLEY ARRGT. AND DETAILS					
	120	PRESSURE REDUCING VALVE—FURNISHED WITH ITEM #119					
	121	TEMP.-PRESSURE GAUGE		↓ ↓	↓ ↓		
	122	TEMP.-PRESS. RELIEF VALVE		↓ ↓	↓ ↓		
	123	GARBAGE DISPOSER—SEE DWG. #7500-364 & #7500-384 GALLEY ARRGT. AND DETAILS FF-744					
	124	SWIRL AND FLOW CONTROL—FURNISHED WITH ITEM #123					
	125	VACUUM BREAKER		↓ ↓	↓ ↓		
	126	SOLENOID VALVE		↓ ↓	↓ ↓		
	127	GARBAGE DISPOSER—SEE DWG. #7500-364 & #7500-384 FF 716					
	128	SWIRL AND FLOW CONTROL—FURNISHED WITH ITEM #127					
	129	VACUUM BREAKER		↓ ↓	↓ ↓		
	130	SOLENOID VALVE		↓ ↓	↓ ↓		
	131	INSTANT WATER HEATER—SEE DWG. #7500-364 & 7500-384 GALLEY ARRGT AND DETAILS					
	132	JET COOKER AND STEAM KETTLE—SEE DWG #7500-364 & #7500-384 GALLEY ARRGT. AND DETAILS					
	133	ICE MAKER—SEE DWG. #7500-364 & #7500-384					
	134	PL-026-03	1/2"	SILL FAUCET			CHICAGO FAUCET #998 OR EQUAL
	135	PL-567-02	1/2"	ELBOW 90° CXM	CAST BRONZE	ANSI B-16.18	NIBCO #707-4 OR EQUAL
	136	PL-070-09	3/4"	STOP VALVE, GATE CXC	BRONZE		↓ #S-29 ↓ ↓
	137	PL-537-12	3/4"	ELBOW 90° CXC	WROT COPPER	ANSI B-16.22	↓ #607 ↓ ↓
	138	PL-555-04	3/4"	UNION CXC	↓ ↓	↓ ↓	↓ #633 ↓ ↓
	139	PL-568-05	3/4"	ELBOW 90° CXF	CAST BRONZE	ANSI B-16.18	↓ #707-3 ↓ ↓
	140	PL-602-05	3/4"	ELBOW 90° STREET M.P.T.XF.P.T.	↓ ↓	↓ ↓	FLAGG #4103 OR EQUAL
	141	PL-633-02	3/8"	UNION ELBOW 90° F.P.T.XF.P.T.	↓ ↓	↓ ↓	↓ #4408 ↓ ↓
	142	PL-600-04	1/2"	ELBOW 90° F.P.T. X F.P.T.	↓ ↓	↓ ↓	↓ #4101 ↓ ↓
	143	PL-070-04	1/2	STOP VALVE F.P.T.XF.P.T.	BRONZE		NIBCO #T29 ↓ ↓
	144	PL-631-04	1/2"	UNION F.P.T.XF.P.T.	CAST BRONZE	ANSI B-16.18	FLAGG #4401 ↓ ↓
	145	PL-631-03	3/8"	UNION F.P.T.XF.P.T.	↓ ↓	↓ ↓	↓ #4401 ↓ ↓
	146	PL-026-05		FAUCET			T/S BRASS & BRONZE #B-321 OR EQUAL
	147	PL-560-10	3/8"	ADAPTER CXF	WROT COPPER	ANSI B-16.22	NIBCO #603 OR EQUAL
	148	PL-062-03	3/8"	ELBOW 90° STREET M.P.T.XF.P.T.	CAST BRONZE	ANSI B-16.18	FLAGG #4103 ↓ ↓
	149	PL-070-12	1/2"	STOP VALVE F.P.T.XF.P.T.	BRONZE		NIBCO #75 ↓ ↓
	150	PL-600-03	3/8"	ELBOW 90° F.P.T.XF.P.T.	CAST BRONZE	ANSI B-16.18	FLAGG #4101 ↓ ↓
	151	PL-024-01		ESCUTCHEON 3/8" I.P.S.			FROST #7423 ↓ ↓
	152	PL-031-01	3/8"	TUBE NUT			NIBCO #500 ↓ ↓
	153	PL-559-10	3/8"	ADAPTER CXM	WROT COPPER	ANSI B-16.22	NIBCO #604 ↓ ↓
	154	PL-026-04	1/2"	SILL FAUCET			CHICAGO FAUCET #952 OR EQUAL
	155	PL-070-11	3/4"	STOP VALVE, GATE F.P.T.XF.P.T.	BRONZE		NIBCO #T-29 OR EQUAL
	156	PL-072-01	3/4"	'Y' STRAINER	CAST BRONZE	ANSI B-16.18	MUELLER #A-15178 OR EQUAL
	157	PL-631-05	3/4"	UNION F.P.T.XF.P.T.	↓ ↓	↓ ↓	FLAGG #4401 OR EQUAL
	158	PL-600-05	3/4"	ELBOW 90° F.P.T. XF.P.T.	↓ ↓	↓ ↓	↓ #4101 ↓ ↓
	159	PL-070-05	3/4"	ANGLE STOP VALVE CXC	BRONZE		NIBCO #777 ↓ ↓
	160	PL-546-68	3/4X1/2X3/4	TEE CXCXC	WROT COPPER	ANSI B-16.22	↓ #611 ↓ ↓
	161	PL-070-07	1/2"	STOP VALVE CXC	BRONZE		↓ #S-29 ↓ ↓
	162	PL-546-62	3/4X3/4X1/2	TEE CXCXC	WROT COPPER	ANSI B-16.22	↓ #611 ↓ ↓
	163	PL-546-69	3/4X1/2X1/2	↓ ↓	↓ ↓	↓ ↓	↓ ↓ ↓ ↓
	164	PL-539-06	3/4"	ELBOW 90° FTG.XC	↓ ↓	↓ ↓	↓ #607-2 ↓ ↓
	165	PL-537-06	1/2"	ELBOW 90° CXC	↓ ↓	↓ ↓	↓ #607 ↓ ↓
	166	PL-561-05	3/4"	ADAPTER FTG XM	↓ ↓	↓ ↓	↓ #604-2 ↓ ↓
	167	PL-600-05	3/4"	ELBOW 90° F.P.T. X F.P.T.	CAST BRONZE	ANSI B-16.18	FLAGG #4101 ↓ ↓
	168	PL-024-03		ESCUTCHEON 3/4" IPS			DEARBORN 1119B OR EQUAL
	169	PL-560-13	1/2"	ADAPTER CXF	WROT COPPER	ANSI B-16.22	NIBCO #603 OR EQUAL
	170	PL-026-06		FAUCET			T/S BRASS AND BRONZE #B-221 OR EQUAL
	171	PL-026-07		PRE-RINSE UNIT			↓ ↓ ↓ ↓ #B-124 ↓ ↓
	172	PL-026-09		FAUCET, ADD ON			↓ ↓ ↓ ↓ #B-156 ↓ ↓
	173	PL-070-06	1/2"	ANGLE STOP VALVE CXC	BRONZE		NIBCO #777 OR EQUAL
	174	PL-559-20	3/4"	ADAPTER CXM	WROT COPPER	ANSI B-16.22	NIBCO #604 ↓ ↓
	175	PL-559-14	1/2"	ADAPTER ↓	↓ ↓	↓ ↓	↓ ↓ ↓ ↓
	176	PL-009-01		GLASS FILLER			EATON #FB 38600 OR EQUAL
	177	PL-607-05	3/4"	TEE F.P.T. X F.P.T. X F.P.T.	CAST BRONZE	ANSI-B-16.18	FLAGG #4121 OR EQUAL
	178	PL-568-01	3/8"	ELBOW CXF.P.T.	CAST BRONZE	ANSI-B-16.18	NIBCO #707-3 OR EQUAL
		PL-616-04	1/2"	COUPLING F.P.T. X F.P.T.	CAST BRONZE	ANSI-B-16.18	FLAGG #4140 OR EQUAL
		08-25	3/4X3/4X1/2	TEE F.P.T. X F.P.T. X F.P.T.	↓ ↓	ANSI B16.18	↓ 4121 ↓

MATERIAL LIST FIXTURES AND ACCESSORIES

REV	ITEM	PART №	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	200	PL-500-03	1/2"	TUBE SEAMLESS	COPPER	ASTM B-88	TYPE "K"
	201	PL-500-05	3/4"	↓ ↓	↓	↓ ↓	↓ ↓
	202	PL-535-02	3/8"	RED BRASS PIPE	RED BRASS	ASTM B-43	CARTERET TO CHROME PLATE.
	203	PL-535-02	3/8"	↓ ↓ ↓	↓ ↓	↓ ↓	
	204	PL-535-03	1/2"	↓ ↓ ↓	↓ ↓	↓ ↓	
	205	PL-535-04	3/4"	↓ ↓ ↓	↓ ↓	↓ ↓	
	206	PL-535-04	3/4"	↓ ↓ ↓	↓ ↓	↓ ↓	CARTERET TO CHROME PLATE
	207	PL-535-05	1"	↓ ↓ ↓	↓ ↓	↓ ↓	↓ ↓ ↓ ↓
	209	PL-534-03	1/4" O.D.	TUBE SEAMLESS	COPPER	ASTM-B-280	TYPE 122 SOFT DRAWN
	208	PL-500-02	3/8"	TUBE SEAMLESS	COPPER	ASTM-B-88	TYPE "K"
	181	PL-555-03	1/2	UNION CXC	WROT COPPER	ANSI-B-16.22	NIBCO NO. 633 OR EQUAL
	182	PL-031-02	1/2 O.D.X3/8 F.P.T.	FEMALE CONNECTOR	BRASS		IMPERIAL EASTMAN NO 66F OR EQUAL
	183	PL-039-03		RUBBER HOSE			
	184	PL-033-02		HOSE CLAMP			IDEAL CORP. NO. 5620
	185	PL-627-06	1/2" X 3/8"	BUSHING, FLUSH	CAST BRONZE	ASTM, B-62	FLAG NO. 4172.
	186	PL-559-09	3/8" X 1/2"	ADAPTER, C X M	WROT. COPPER	ANSI, B-16.22	NIBCO NO. 604.
	187	PL-024-04	3/8"	ESCUTCHEON 3/8" I.P.S.			FROST #7438
	188	PL-607-03	3/8"	TEE F.P.T. X F.P.T. X F.P.T.	CAST BRONZE	ANSI-B-16.15	FLAGG NO. 4121
	189	PL-070-33	3/8"	STOP VALVE F.P.T. X F.P.T.	CAST BRONZE		NIBCO #T22
	190	PL-062-07	1/4" x 3/8"	ADAPTER C X M.P.T.	WROT COPPER	ANSI-B-16.22	MUELLER NO. WC-401 W-1105
	191	PL-062-04	1/4"	FLARE NUT	FORGED BRASS		IMPERIAL EASTMAN #641-FS
	192	PL-028-01	3/8"	VACUUM BREAKER			T&S BRASS & BRONZE B-968
	193	PL-546-64	3/4" X 3/4" X 1/4"	TEE C X C X C	WROT COPPER	ANSI-B-16.22	NIBCO NO. 611
	72	PL 546-59	3/4" X 3/4" X 3/4"	TEE, CXCXC	WROT COPPER	ANSI, B16.22	NIBCO NO. 611.
	70	PL 600-05	3/4"	90° ELBOW, FTG. X FTG.	CAST BRONZE	ASTM, B-62	FLAGG NO. 4101.
	71	PL 543-06	3/4"	45° ELBOW, C X C.	WROT COPPER	ANSI, B16.22	NIBCO NO. 606.



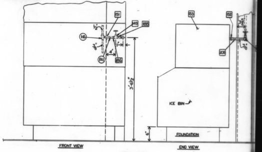
DETAIL 15-D3
COOKSTABLE SINK
613 & 614 GALLEY ONLY



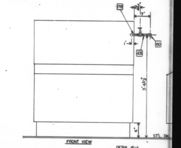
DETAIL 15-D2
COOKS TABLE SINK
615 GALLEY ONLY

188
187
202
189

NOTE: LOCATE VACUUM BREAKER AT A MIN. OF 4' ABOVE WATER LEVEL IN COFFEE MAKER.



DETAIL 15-B
ICE MAKER
615 GALLEY ONLY

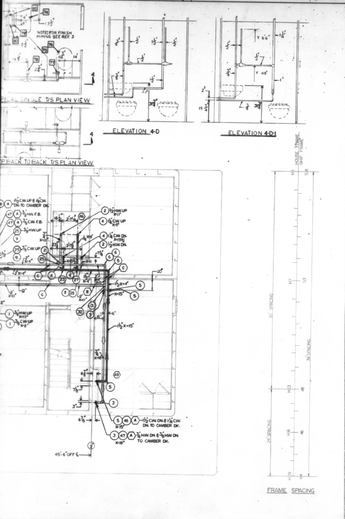


DETAIL 15-A
ICE MAKER
613 & 614 GALLEY ONLY

2350-1344

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80 10X
FRAME 5


NOTE: FOR FINISH PIPING SEE REF 3
TYPICAL SINGLE T/S PLAN VIEW
TYP BACK TO BACK T/S PLAN VIEW
ELEVATION 4-D
ELEVATION 4-D-1
1½" C.W. UP & 1⅛" C.W. DN. TO CAMBER DK.
2½" H.W. UP
1⅛" C.W. DN.
1½" H.W. DN.
3⁄8" H.W. UP
3⁄8" C.W. UP
1½" C.W. DN. & 1⅛" C.W. DN. TO CAMBER DK.
3⁄8" H.W. DN. & 3⁄8" H.W. DN. TO CAMBER DK.
45'-6" OFF ℄
HOUSE FRAME
SHIP FRAME
30" SPACING
36" SPACING
24" SPACING
FRAME SPACING

LIST OF MATERIAL

PIPE LIST

REV	ITEM	PART Nº	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	P-1	PL-500-02	3/8"	TUBE SEAMLESS TYPE 'K'	COPPER	ASTM B-88	.500 O.D.X.049 WALL
	P-2	PL- -03	1/2"	↓	↓	↓	.625 O.D.X.049 WALL
	P-3	PL- -05	3/4"	↓	↓	↓	.875 O.D.X.065 WALL
	P-4	PL- -07	1 1/4"	↓	↓	↓	1.375 O.D.X.065 WALL
	P-5	PL- -08	1 1/2"	↓	↓	↓	1.625 O.D.X.072 WALL
	P-6	PL- -09	2"	↓	↓	↓	2.125 O.D.X.083 WALL
	P-7	PL- -11	3"	↓	↓	↓	3.125 O.D.X.109 WALL

MATERIAL LIST

REV	ITEM	PART Nº	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	1	PL-537-04	3/8"	ELBOW 90° CXC	WROT COPPER	ANSI B16.22	
	2	PL-537-06	1/2"	↓	↓	↓	
	3	PL-537-12	3/4"	↓	↓	↓	
	4	PL-537-21	1 1/4"	↓	↓	↓	
	5	PL-537-23	1 1/2"	↓	↓	↓	
	6	PL-537-25	2"	↓	↓	↓	
	7	PL-568-01	3/8"	ELBOW 90° CXF.P.T.	BRONZE	ANSI B16.18	
	8	PL-556-11	3/4X3/8"	REDUCER FTG.X C	WROT COPPER	ANSI B16.22	
	9	PL-556-04	1/2X3/8"	↓	↓	↓	
	10	PL-556-33	3"X2"	↓	↓	↓	
	11	PL-556-35	3"X1 1/4"	↓	↓	↓	
	12	PL-546-37	1 1/2X1 1/2X3/4	TEE CXCXC	WROT COPPER	↓	
	13	PL-546-59	3/4X3/4X3/4	↓	↓	↓	
	14	PL-546-93	1 1/4X1 1/4X1 1/4	↓	↓	↓	
	15	PL-546-99	1 1/4X1 1/4X3/8	↓	↓	↓	
	16	PL-547-09	1 1/4X1/2X1 1/4	↓	↓	↓	
	17	PL-547-10	1 1/2X1 1/2X1 1/2	↓	↓	↓	
	18	PL-547-12	1 1/2X1 1/2X1 1/4	↓	↓	↓	
	19	PL-547-16	1 1/2X1 1/4X1 1/2	↓	↓	↓	
	20	PL-547-27	1 1/2X3/4X1 1/4	↓	↓	↓	
	21	PL-547-32	2"X2"X2"	↓	↓	↓	
	22	PL-547-34	2"X2"X1 1/2	↓	↓	↓	
	23	PL-547-35	2"X2"X1 1/4"	↓	↓	↓	
	24	PL-547-37	2"X2"X3/4	↓	↓	↓	
	25	PL-547-38	2"X2"X1/2	↓	↓	↓	
	26	PL-547-39	2"X1 1/2X2"	↓	↓	↓	
	27	PL-547-41	2X1 1/2X1 1/4	↓	↓	↓	
	28	PL-547-46	2X1 1/4X1 1/2	↓	↓	↓	
	29	PL-547-47	2X1 1/4X1 1/4	↓	↓	↓	
	30	PL-547-53	2"X3/4X2"	↓	↓	↓	
	31	PL-547-54	2"X1/2X2"	↓	↓	↓	
	32	PL-547-73	3"X3"X3"	↓	↓	↓	
	33	PL-547-86	3X2X2	↓	↓	↓	
	34	PL-546-95	1 1/4X1 1/4X1 1/2	↓	↓	↓	
	35	PL-070-02	2"	VALVE STOP, GATE	BRONZE		NIBCO OR EQUAL
	36	PL-070-03	1 1/4"	↓	↓		
	37	PL-568-02	1/2"	ELBOW CX F.P.T.	↓	ANSI B16.18	
	38	PL-149-71	3"	SLEEVE	STEEL GR.1015		3 5/8 O.D.X.247 W. X 3" LG.
	39	PL-562-13	2"	ADAPTER FTG. X F.P.T.	WROT COPPER	ANSI B16.22	
	40	PL-547-15	1 1/2X1 1/2X1 1/2	TEE CXCXC	WROT COPPER	ANSI B16.22	
	41	PL-579-09	2"	CROSS CXCXCXC	CAST BRONZE	ANSI B16.18	
	42	PL-560-30	2"	ADAPTER C X F.P.T.	WROT COPPER	ANSI B16.22	
	43	PL-560-19	3/4"	ADAPTER C X F.P.T.	WROT COPPER	ANSI B16.22	
	44	PL-628-06	2"	PLUG DRAIN SQ. HD. F.P.T.	CAST BRONZE	ANSI B16.18	
	45	PL-628-02	3/4"	PLUG DRAIN SQ. HD. F.P.T.	CAST BRONZE	ANSI B16.18	
	46	PL-149-67	2"	SLEEVE	STEEL GR.1015		2 5/8 O.D.X.247 W. X 3" LG.
	47	PL-149-53	3/8"	↓	↓		1" O.D.X.247 W. X 3" LG.
	48	PL-149-63	1 1/4"	↓	↓		1 7/8 O.D.X.247 W. X 3" LG.
	49	PL-539-10	2"	ELBOW 90° FTG. X C.	WROT COPPER	ANSI-B16.22	
	50	PL-149-55	1/2"	SLEEVE	STEEL GR.1015		1 1/8 O.D.X.247 W X 3" LG.
	51	PL-539-09	1 1/2	ELBOW 90° FTG X C	WROT COPPER	ANSI-B16.22	
	52	PL-575-10	2"X2"X2"	TEE CXFXC	CAST BRONZE	ANSI-B-16.18	
	53	PL-564-01	3/8"	BULKHEAD FITTING	CAST BRONZE	ANSI-B-16.18	NIBCO 750-3 OR EQUAL

FOR CONTINUATION OF PARTS LIST SEE ZONE 8-D

REVISIONS

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHO	OWNER DATE	OWNER APPD
O		SUBMITTED FOR APPROVAL			1-5-77	SHELL
A		1. INITIAL ISSUE 2. RELOCATED POTABLE WATER FROM CARGO CONTROL ROOM TO PASSAGE WAY. 3. DELETED C.W. RUN AT 21'-9¼" OFF ℄ PORT SIDE. 4. ADDED ½" H.W. PENETRATION IN AFT SECTION FOAM RM. 6' OFF ℄ AND FORWARD 7" OF FR. H19. 5. DELETED POTABLE WATER RUN IN FAN ROOM AT FR H7 APPROX 5'-0" OFF ℄.	5-2-77	RLH	3-16-77 4-8-77	SHELL ZAPATA
B		1. T/S A-6 "X" DIM ADDED TO 1¼" C.W. DN & ½" H.W. DN. 2. ℄ FR. H7 3/8" C.W. UP X=8" WAS 4". 3. ℄ FR. H2 3/8" C.W. X=18½" WAS 16". 4. T/S A-27 3/4" H.W. REVISED. 5. T/S A-24 ½" H.W. REVISED. 6. OVERHEAD DARKROOM 2" H.W. X=11 & X=6 9/16" WAS X=15 3/16". 6-6-77 R.W.M.	6-20-77	RLH		
C		1. 15'-0" STBD. ℄ FR. H7 ITEM 22 WAS ITEM 23. 7-12-77 R.W.M. 2. 39'-0 5/8" PORT ℄ FR. H5 (3) ITEM 24 WAS (3) ITEM 25. 3. ℄ FR. H6 & H7 (2) - ITEM 9 MOVED AFT TO MATE W/MAIN RUN. 4. 4'-8¼" OUTBOARD 39'-0 5/8" STBD. ℄ & 10½" AFT. H6 ITEM 24 & 25 ADDED. 7-13-77 R.W.M. 5. ℄ FR. H19 FILTER CLEANING SINK PENETRATIONS REV. 6. DETAIL 7-D FOR FLTR CLG SINK ADDED, PARTS LIST REV. TO SUITE. 7. ITEM 53 & 61 PART No REV. 8-9-77 R.W.M. 8. APPROX 14'-0" PORT ℄ FR. H5, H6 & H7 (4) ITEM No. 49 WAS (4) ITEM No. (4). 8-22-77 R.W.M. 9. REV ITEM 53 TO PL 025-03 10. ADDED ITEM 94 & 95 11. REV C. 0.43-9" OFF ℄ FR. TO BTWN H7 & 8 12. REV Pc NO FROM 18 3/4 TO 17 1/2 & 7 1/2" FWD FR H11, 25-11½ OFF ℄ STB	9-26-77 4-8-78	LWC AC	1-6-78 1-26-78	UTN SHELL 2/3/78

AUTHORITY:

GENERAL NOTES:
1. FOR GENERAL NOTES SEE REF 5
2. JOB TO TEMPLATE ALL WORK.
3. FOR INSULATION REQUIREMENTS SEE REF. 5
4. FOR MATERIAL INDICATED THUS ☐ SEE REF. 3
5. ALL PENETRATIONS THRU GIRDERS, STEEL BULKHDS., DECKS, AND DRAFT STOPS ARE INDICATED ⬡ THUS SEE REF. 5 FOR PROPER DETAIL.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615 614 613	311 310 309	

APPROVALS
OWNERS: SHELL APVL. LTR. 1429V 2-4-77; ZAPATA APVL. LTR. DATED 4-21-77; NEWPORT NEWS APPROVAL LTR. 613C/C2350 DATED 5-2-77
U.S.P.H. APVL. LTR. DATED 12/29/76
ABS N.R.
USCG N.R.

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689 DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.
H.B. DWG NO.
SHT. OF.

SCALE 3/16" = 1 FT
DRAWN BOB CARBER
CHECKED A.H. Salzman
SECT MGR J. T. Cozzatt
DATE COMPL. 11-15-76
EXAMINED –
AUTHORIZED A. Conley
DATE 6-30-77
TECH APPROVAL
C S D APPROVAL R. L. Harrington

POTABLE WATER SYS. ARRGT.
"A" DECK

U S M A DESIGN T11-S-116A
U S M A DWG NO.
HULL NO.
DWG NO. 2350-1347
REV. C
SHEET NO. 1 OF 1

NO.	REFERENCES	DWG NO.
6		
5	TYP. PIPING INSTALL. DET. & GEN. NOTES	2502-140
4	POTABLE WATER SYS. ARRGT. "B" DK.	2350-1348
3	PLUMBING FIXTURE LIST.	2502-138
2	DIAG. POTABLE WATER SYS. LIST.	2350-1343
1	DIAG. POTABLE WATER SYS. ARRGT.	2350-1342

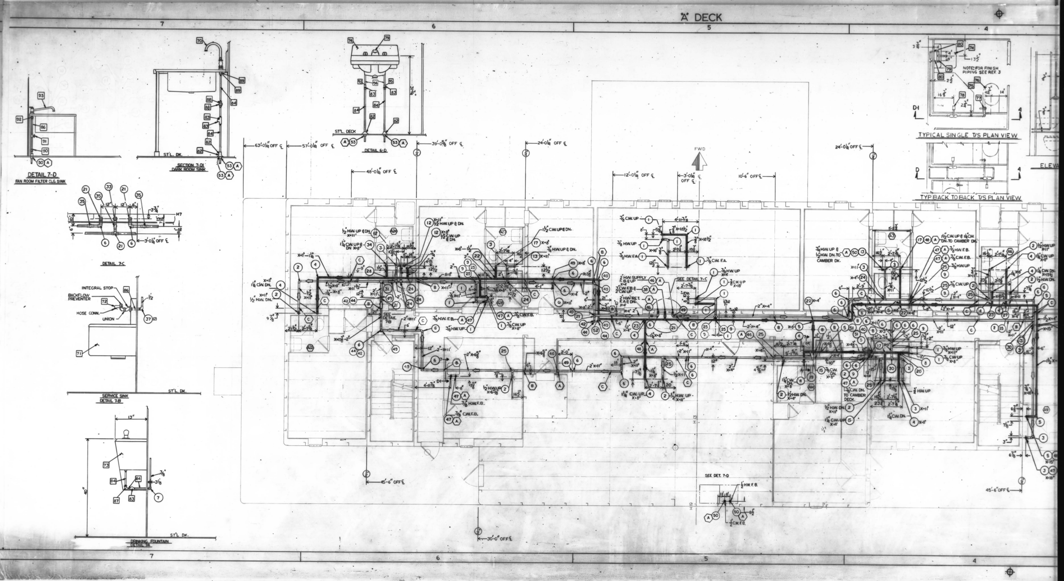
REPRODUCTION OFFICE

2350 - 1347

MICRO-MASTER 105 mm K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK KEUFFEL & ESSER CO.

SEPT. '80
10X
FRAME 1

	REMARKS
	T/S Nº B-321 OR EQUAL
	ELKAY #2520 OR EQUAL
	CRANE #8-3757 OR EQUAL
	EATON #WHA 12 OR EQUAL
	CRANE #1-195-S OR EQUAL
	CRANE #3-446 OR EQUAL
	SLOAN #110-YO OR EQUAL
	MOENTROL #BB-3170 OR EQUAL
	CRANE #8-2177A OR EQUAL
	CRANE #8-5003 OR EQUAL
	NIBCO #750-3 OR EQUAL
	FROST #7423 OR EQUAL
	CRANE #8-5111 OR EQUAL
43	CARTERET TO CH. PLATE
	FLAGG #4408 OR EQUAL
	#4401
	#4140
22	NIBCO 603 OR EQUAL
18	T29
	FLAGG 4401
	T/S BRASS & BRONZE B-221
	CRANE #50030
	FROST #5154 OR EQUAL


'A' DECK
7
6
5
4
DETAIL 7-D
FAN ROOM FILTER CLG. SINK
ST'L. DK.
SECTION 7-D1
DARK ROOM SINK
ST'L. DECK
DETAIL 6-D
DETAIL 7-C
INTEGRAL STOP
BACKFLOW PREVENTER
HOSE CONN.
UNION
SERVICE SINK
DETAIL 7-B
DRINKING FOUNTAIN
DETAIL 7A
NOTE: FOR FINISH PIPING SEE REF. 3
TYPICAL SINGLE T/S PLAN VIEW
TYP BACK TO BACK T/S PLAN VIEW
ELEVA
FWD
63'-0¼" OFF ℄
57'-0¼" OFF ℄
39'-0⅜" OFF ℄
48'-0¼" OFF ℄
24'-0¼" OFF ℄
12'-0¼" OFF ℄
3'-0¼" OFF ℄
10'-6" OFF ℄
24'-0¼" OFF ℄
45'-6" OFF ℄
30'-0" OFF ℄
45'-6" OFF ℄
SEE DETAIL 7-C
SEE DETAIL 7-B
SEE DET. 7-D
TO CAMBER DECK

2350 - 1347

MICRO-MASTER 105 mm

K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

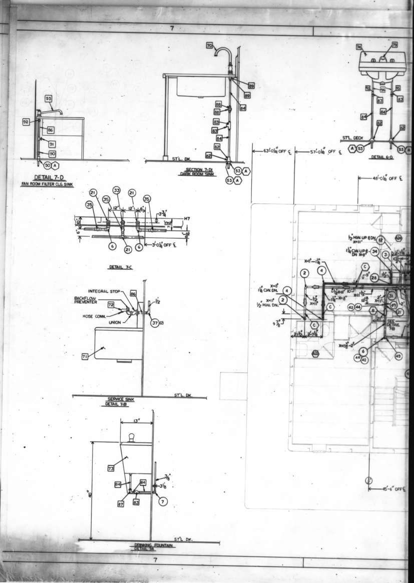
FRAME 2

8

MATERIAL LIST FIXTURES AND ACCESSORIES

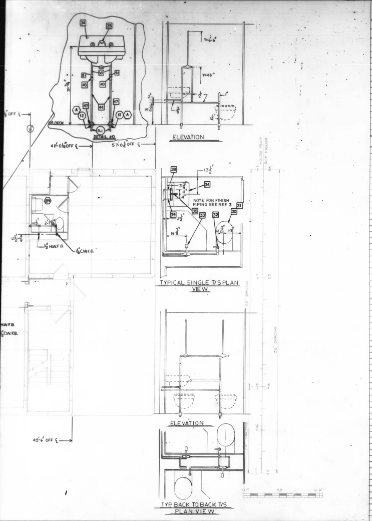
REV.	ITEM	PART Nº	SIZE	DESCRIPTION	MATERIAL	SPEC.	REMARKS
	70	PL-026-05		FAUCET			T&S Nº B-321 OR EQUAL
	71	PL-006-01		SERVICE SINK			ELKAY #2520 OR EQUAL
	72	PL-026-02		SERVICE SINK TRIM			CRANE #8-3757 OR EQUAL
	73	PL-008-01		DRINKING FOUNTAIN			EATON #WHA 12 OR EQUAL
	74	PL-004-01		LAVATORY			CRANE #1-195-S OR EQUAL
	75	PL-001-01		WATER CLOSET			CRANE #3-446 OR EQUAL
	76	PL-002-01		WATER CLOSET SEAT			
	77	PL-071-01		FLUSH VALVE			SLOAN #110-YO OR EQUAL
	78	PL-003-01		SHOWER HEAD AND VALVE			MOENTROL #BB-3170 OR EQUAL
	79	PL-026-01		LAVATORY TRIM			CRANE #8-2177A OR EQUAL
	80	PL-025-01		LAVATORY SUPPLY			CRANE #8-5003 OR EQUAL
	81	PL-564-01		BULKHEAD FITTING			NIBCO #750-3 OR EQUAL
	82	PL-024-01		ESCUTCHEON			FROST #7423 OR EQUAL
	83	PL-025-03		LOOSE KEY STOP STR.			CRANE #8-5111 OR EQUAL
	84	PL-535-02	3/8"	RED BRASS PIPE	RED BRASS	ASTM B-43	CARTERET TO CH. PLATE
	85	PL-535-05	1"	↓	↓	↓	↓
	86	PL-535-03	1/2"	↓	↓	↓	↓
	87	PL-633-02	3/8"	UNION ELBOW 90°	CAST BRONZE		FLAGG #4408 OR EQUAL
	88	PL-631-03	3/8"	UNION	↓		#4401
	89	PL-618-06	3/8"	REDUCING COUPLING	↓		#4140
	90	PL-560-13	1/2"	ADAPTER C X F.P.T.	WROT COPPER	ANSI-B16.22	NIBCO 603 OR EQUAL
	91	PL-070-04	1/2"	STOP VALVE F.P.T. X F.P.T.	CAST BRONZE	ANSI-B16.18	T29
	92	PL-631-04	1/2"	UNION F.P.T. X F.P.T.	↓	↓	FLAGG 4401
	93	PL-026-06		FAUCET			T/S BRASS & BRONZE B-221
	94	PL-025-02		LAV SUPPLY (LESS KEY STOP)			CRANE #50030
	95	PL-062-06		MALE CONNECTOR 3/8 SPS x 1/2 O.D. MALE STR.			FROST #8154 OR EQUAL

8


7
DETAIL 7-D
FAN ROOM FILTER CLG. SINK
SECTION 7-D1
DARK ROOM SINK
ST'L. DK.
DETAIL 6-D
ST'L. DECK
DETAIL 7-C
INTEGRAL STOP
BACKFLOW PREVENTER
HOSE CONN.
UNION
SERVICE SINK
DETAIL 7-B
DRINKING FOUNTAIN
DETAIL 7A
SEE DETAIL 7-B
7

2350 - 1347

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
10X
FRAME 3



LIST OF MATERIAL

PIPE LIST

REV	ITEM	PART NO.	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	P-1	PL-500-02	3/8"	TUBE SEAMLESS TYPE "K"	COPPER	ASTM B-88	.500 O.D.X.049 WALL
	P-2	PL-500-03	1/2"	↓	↓	↓	.625 O.D.X.049 WALL
	P-3	PL-500-08	1 1/2"	↓	↓	↓	1.625 O.D.X.072 WALL
	P-4	PL-500-05	3/4"	↓	↓	↓	.875 O.D.X.065 WALL

MATERIAL LIST

REV	ITEM	PART NO.	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	1	PL-149-55	1/2"	SLEEVE	STEEL GR.1015		1 1/8" O.D.X.247 W.X 3" LG.
	2	PL-149-53	3/8"	↓	STEEL GR.1015		1" O.D.X.247 W.X 3" LG.
	3	PL-568-02	1/2"	ELBOW 90° C X F.P.T.	WROT COPPER	ANSI-B-16.22	
	4	PL-568-01	3/8"	ELBOW 90° C X F.P.T.	WROT COPPER	↓	
	5	PL-149-67	2"	SLEEVE	STEEL GR.1015		2 5/8" O.D.X.247 W.X 3" LG.
	6	PL-537-12	3/4"	ELBOW 90° CXC	WROT COPPER	ANSI-B-16.22	
	7	PL-537-23	1 1/2"	↓	↓	↓	
	8	PL-547-34	2"X2"X1 1/2"	TEE CXCXC	↓	↓	
	9	PL-547-37	2X2X3/4	↓	↓	↓	
	10	PL-070-08	1 1/2"	STOP VALVE GATE CXC	CAST BRONZE		
	11	PL-070-09	3/4"	↓	↓		
	12	PL-564-01	3/8"	BULKHEAD FITTING	CAST BRONZE	ANSI-B-16.18	NIBCO 750-3 OR EQUAL
	13	PL-564-02	1/2"	↓	↓	↓	↓

MATERIAL LIST: FIXTURES AND ACCESSORIES

REV	ITEM	PART NO.	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	30	PL-001-01		WATER CLOSET			CRANE #3-446 OR EQUAL
	31	PL-002-01		WATER CLOSET SEAT			
	32	PL-071-01		FLUSH VALVE			SLOAN ROYAL #110-YO OR EQUAL
	33	PL-003-01		SHOWER HEAD & VALVE			MOENTROL #BB-3170 OR EQUAL
	34	PL-004-01		LAVATORY			CRANE #1-195-S OR EQUAL
	35	PL-026-01		LAVATORY TRIM			CRANE #8-2177A OR EQUAL
	36	PL-008-01		DRINING FOUNTAIN			EATON #WHA-12 OR EQUAL
	37	PL-006-01		SERVICE SINK			ELKAY #2520 OR EQUAL
	38	PL-026-02		SERVICE SINK TRIM			CRANE #8-3757 OR EQUAL
	39	PL-025-01		LAVATORY SUPPLY			CRANE #8-5003 OR EQUAL
	40	PL-025-03		LOOSE KEY STOP STR.			CRANE #8-5111 OR EQUAL
	41	PL-633-02	3/8"	UNION ELBOW 90°	CAST BRONZE	ANSI B-16.18	FLAGG #4408 OR EQUAL
	42	PL-600-04	1/2"	ELBOW 90°	↓		FLAGG #4101 OR EQUAL
	43	PL-602-04	1/2"	ELBOW 90° STREET	↓		FLAGG #4103 OR EQUAL
	44	PL-535-02	3/8"	RED BRASS PIPE	RED BRASS	ASTM B-43	CARTERET TO CH. PLATE
	45	PL-535-03	1/2"	↓	↓	↓	
	46	PL-535-05	1"	↓	↓	↓	CARTERET TO CH PLATE
	47	PL-024-01	3/8"	ESCUTCHEON			FROST #7423 OR EQUAL
	48	PL-564-01	3/8"	BULKHEAD FITTING	CAST BRONZE	ANSI B-16.18	NIBCO #750-3 OR EQUAL
	49	PL-564-02	1/2"	↓	↓	↓	↓
	50	PL-025-02		LAV. SUPPLY (LESS KEY STOP)			CRANE #8-5003 OR EQ.
	51	PL-062-05		MALE CONNECTOR 3/8 SPS X 1/2 O.D MALE STR			FROST #8154 OR EQUAL

REVISIONS

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTH	OWNER DATE	OWNER APPD
O		SUBMITTED FOR APPROVAL			2-9-77	SHELL
A		1. INITIAL ISSUE 2. ADDED POTABLE WATER TO "B" DK. OVERHEAD TO SUPPLY T/S B1 & B2 3. CHANGED PENETRATION AT T/S B1 & B2 TO 3/8" FOR LAVATORY. 4. REVISED C.W. AT T/S B22 TO SUPPLY FROM ABOVE.	5-2-77	RLH	3-15-77 4-2-77	SHELL ZAPATA
B		1. T/S B-9 1 1/4" C.W. RB. WAS 1 1/2" 6-6-77 R.W.M.	6-6-77	RLH		
C		1. ITEM 12, 13, 48 & 49 PART NO. REV. 8-9-77 R.W.M. 2. ITEM 40 REV TO PL 025-03 3. ADDED ITEM 50 & 51	3-8-78	LWC AC		USPH SHELL

AUTHORITY:

GENERAL NOTES:

1. FOR GENERAL NOTES SEE REF 5
2. JOB TO TEMPLATE ALL WORK.
3. FOR INSULATION REQUIREMENTS SEE REF. 5
4. FOR MATERIAL INDICATED THUS ☐ SEE REF #3
5. ALL PENETRATIONS THRU GIRDERS, STEEL BULKHDS., DECKS AND DRAFT STOPS ARE INDICATED ⬡ THUS SEE REF. 5 FOR PROPER DETAIL

NO.	REFERENCES	DWG NO.
6		
5	TYP. PIPING INSTALL. DET. & GEN. NOTES	2502-140
4	POTABLE WATER SYS. ARRGT. "A" DK.	2350-1347
3	PLUMBING FIXTURE LIST	2502-138
2	DIAG. POTABLE WATER SYS. DIAG.	2350-1343
1	DIAG. POTABLE WATER SYS. ARRGT.	2350-1342

N N S & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615	311	
614	310	
613	309	

APPROVALS

OWNERS SHELL APVL. LTR. 7/29V 2-9-77 ZAPATA APVL. LTR. DATED 4-21-77 NEWPORT NEWS APPROVAL LTR. 613C/C2350 DATED 5-2-77	ABS NR	USPH APVL LTR 2-4-77
	USCG NR	

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.
H.B. DWG NO.
SHT. OF.

SCALE 3/8" = 1 FT
DRAWN Bob Barber
CHECKED B.H. Salmon
SECT MGR J. F. Caputo
DATE COMPL. 11-16-76
EXAMINED —
AUTHORIZED A. CONLEY
DATE 6-30-77
TECH APPROVAL
C S&D APPROVAL R.L. HARRINGTON

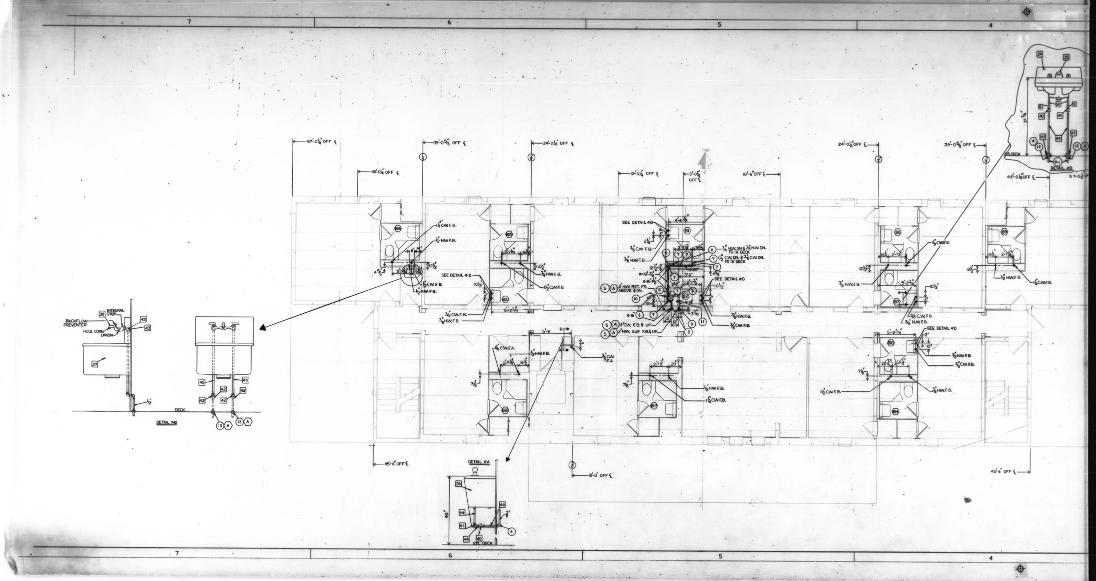
POTABLE WATER SYS. ARRGT.
"B" DECK

U S M A DESIGN T11-S-116A
U S M A DWG NO.
HULL NO.
DWG NO. 2350-1348
REV C
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
GROUP:
MC NO.

2350-1348

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 1


7
6
5
4
57'-0⅛" OFF ℄
48'-0⅛" OFF ℄
39'-0⅝" OFF ℄
24'-0⅛" OFF ℄
12'-0¼" OFF ℄
3'-0¼" OFF ℄
10'-6" OFF ℄
FWD
SEE DETAIL 4-D
1¼" C.W. F.B.
½" H.W. F.B.
⅜" C.W. F.B.
⅜" H.W. F.B.
¾" H.W. DN. & ⅜" H.W. DN. TO "A" DECK
1½" C.W. DN. & ⅜" C.W. DN. TO "A" DECK
2" H.W. RET. FR. ABOVE & DN.
2" C.W. F.B. & UP
2" H.W. SUP. F.B. & UP
X=19'-3¼"
X=16'-1½"
X=20"
X=19"
X=16"
B1
B2
B
1½" C.W. F.B.
1¼" C.W. F.A.
½" H.W. F.B.
¾" H.W. F.B.
⅜" C.W. F.A.
BACKFLOW PREVENTER
INTEGRAL STOP
HOSE CONN.
UNION
DECK
DETAIL 7-B
DETAIL 6-A
STL. DECK
DETAIL 4-D
45'-6" OFF ℄
18'-0" OFF ℄
40"

MICRO-MASTER® 105 mm

K+E

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ALEXANDRIA • RICHMOND • NORFOLK

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KEUFFEL & ESSER CO.

SEPT. '80

10X

FRAME 2

2350 - 1348

LIST OF MATERIAL

PIPE LIST

REV	ITEM	PART Nº	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	P-1	PL-500-02	3/8"	TUBE SEAMLESS TYPE 'K'	COPPER	ASTM-B-88	.500 O.D. X .049 WALL
	P-2	PL-500-03	1/2"				.625 O.D. X .049 WALL
	P-3	PL-500-05	3/4"				.875 O.D. X .065 WALL
	P-4	PL-500-07	1 1/4"				1.375 O.D. X .065 WALL
	P-5	PL-500-08	1 1/2"				1.625 O.D. X .072 WALL
	P-6	PL-500-09	2"				2.125 O.D. X .083 WALL

MATERIAL LIST

REV	ITEM	PART Nº	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	1	PL-537-06	1/2"	ELBOW 90° CXC	WROT COPPER	ANSI-B16.22	
	2	PL-537-12	3/4"				
	3	PL-537-21	1 1/4"				
	4	PL-537-23	1 1/2"				
	5	PL-537-25	2"				
	6	PL-546-37	1/2X1/2X3/4	TEE CXCXC			
	7	PL-546-41	1/2X3/8X1/2				
	8	PL-546-59	3/4X3/4X3/4				
	9	PL-546-68	3/4X1/2X3/4				
	10	PL-546-69	3/4X1/2X1/2				
	11	PL-546-95	1 1/4X1 1/4X1 1/2				
	12	PL-547-12	1 1/2X1 1/2X1 1/4				
	13	PL-547-16	1 1/2X1 1/4X1 1/2				
	14	PL-547-26	1 1/2X3/4X1 1/2				
	15	PL-547-27	1 1/2X3/4X1 1/4				
	16	PL-547-32	2X2X2				
	17	PL-547-34	2X2X1 1/2				
	18	PL-547-35	2X2X1 1/4				
	19	PL-547-37	2X2X3/4				
	20	PL-547-38	2X2X1/2				
	21	PL-547-39	2X1 1/2X2				
	22	PL-547-41	2X1 1/2X1 1/4				
	23	PL-547-53	2X3/4X2				
	24	PL-149-53	3/8"	SLEEVE	STEEL GR.1015		1" O.D. X .247 W X 3" LG.
	25	PL-149-58	3/4"				1 3/8 O.D. X .247 W X 3 LG.
	26	PL-149-64	1 1/2"				2 1/8 O.D. X .247 W X 3" LG.
	27	PL-149-67	2"				2 5/8 O.D. X .247 W X 3" LG.
	28	PL-547-01	3/8X3/8X3/8	TEE CXCXF	CAST BRONZE		
	29	PL-562-05	1/2X1/2	ADAPTER FTGXF	WROT COPPER	ANSI-B-16.22	
	30	PL-568-02	1/2X1/2	ELBOW 90° CXF	CAST BRONZE		
	31	PL-070-02	2"	STOP VALVE GATE CXC			NIBCO #S-29 OR EQUAL
	32	PL-547-54	2X1/2X2"	TEE CXCXC	WROT COPPER	ANSI-B-16.22	
	33	PL-547-17	1 1/2X1 1/4X1 1/4				
	34	PL-149-63	1 1/4"	SLEEVE	STEEL GR.1015		1 7/8 O.D. X .247 W X 3" LG.
	35	PL-547-40	2X1 1/2X1 1/2	TEE CXCXC	WROT COPPER	ANSI-B-16.22	
	40	PL-560-13	1/2"	ADAPTER CXF.P.T.			
	41	PL-550-37	1 1/2X1 1/4	REDUCER CXC			
	42	PL-546-35	1/2 x 1/2 x 1/2	TEE C x C x C	WROT COPPER	ANSI B16.22	

FOR CONTINUATION OF MATERIAL LIST SEE ZONE 10-D

REVISIONS

REV	ZONE	DESCRIPTION	NNS & DD CO DATE	NNS & DD CO AUTH	OWNER DATE	OWNER APPD
0		SUBMITTED FOR APPROVAL			2-1-77	SHELL
A		1. INITIAL ISSUE 2. RELOCATED MAIN POTABLE WATER RUNS TO PASSAGE WAY. 3. ADDED 1 1/4" C.W. RUN ON. TO "B" DECK AT T/S C19. 4. ADDED 3/4" C.W. RUN AT HOUSE FRONT 16' 8" OFF ℄.	5-27-77	RLH	5-15-77 4-21-77	SHELL ZAPATA
B		1. REV. "X" DIMS. ON 1/2" H.W. IN OVERHEAD AT T/S C-10 & C-11. 2. REV. "X" DIMS. ON 1 1/2" & 3/4" CW IN OVERHEAD AT T/S C3. 3. REV. "X" DIMS ON 1 1/4" C.W. & 1/2" H.W. IN OVERHEAD AT T/S C-14. 4. REV. "X" DIMS ON H.W. & C.W. LINES IN OVERHEAD RUNNING TO LAUNDRY. 5. "X" DIMS. ADDED TO H.W. & C.W. IN OVERHEAD AT T/S C-26 6-6-77 R.W.M.	6-20-77	RLH		
C		1. ITEM 36 WAS 29 DET. 9-A. 2. 9'-1" STBD. ℄ 12" FWD. HB 1 1/2" LINE WAS 1 1/4" LINE, LABELED WRONG. 3. 5'-6 1/4" INBOARD OF 24'-0 1/4" STBD. ℄ 12" FWD HB ITEM 18 WAS 22. 4. 6'-3 1/4" INBOARD OF 24'-0 1/4" STBD. ℄ 4 3/4" FWD HB ITEM 37 ADDED; 615 ONLY. 7-13-77 R.W.M. 5. ITEM 40 & 41 WAS ITEM 36 & 37 7-14-77 R.W.M. 6. REV ITEM 32 TO PL025-03 7. ADDED SECT 6-A & ITEM 42 TO [illegible]	[illegible]	AC		
D		1) ADDED BUBBLE NO'S. TO SECT 6A TO CORRECT.				

AUTHORITY:

GENERAL NOTES:

1. FOR GENERAL NOTES SEE REF. 5
2. JOB TO TEMPLATE ALL WORK
3. FOR INSULATION REQUIREMENTS SEE REF. 5
4. FOR MATERIAL INDICATED THUS ☐ SEE REF. 3
5. ALL PENETRATIONS THRU GIRDERS, STL. BULKHDS, DECKS AND DRAFT STOPS ARE INDICATED ⬡ THUS SEE REF. 5 FOR PROPER DETAIL.

NO.	REFERENCES	DWG NO.
5	TYP. PIPING INSTALL. DET. & GEN. NOTES	2502-140
4	POTABLE WATER SYS ARRGT "D" DECK	2350-1350
3	PLUMBING FIXTURE LIST	2502-138
2	DIAG POTABLE WATER SYS ARRGT	2350-1343
1	DIAG POTABLE WATER SYS ARRGT	2350-1342

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615	311	
614	310	
613	309	

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS

OWNERS SHELL APVL. LTR. DATED 2-1-77 ZAPATA APVL. LTR. DATED 4-21-77		ABS	N.R.
NEWPORT NEWS APPROVAL LTR. G13C/C2350 DATED 5-2-77		USCG	N.R.
U.S.P.H. APVL. LTR. DATED 12/29/76			

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689 DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

SCALE 3/8" = 1 FT	DATE COMPL. 11-15-76
DRAWN D. Badger	EXAMINED —
CHECKED M. Salminen	AUTHORIZED A. Conley
SECT MGR J. T. Cogate	DATE 6-30-77
TECH APPROVAL	CSD APPROVAL R.L. Harrington

POTABLE WATER SYS ARRGT
"C" DECK

U S M A DESIGN T11-S-116a
U S M A DWG NO
HULL NO 613, 614, 615

DWG NO.	REV	SHEET NO. OF
2350-1349	D1	

REPRODUCTION OFFICE

GROUP

MC NO.

2350-1349

MICRO-MASTER 105 mm

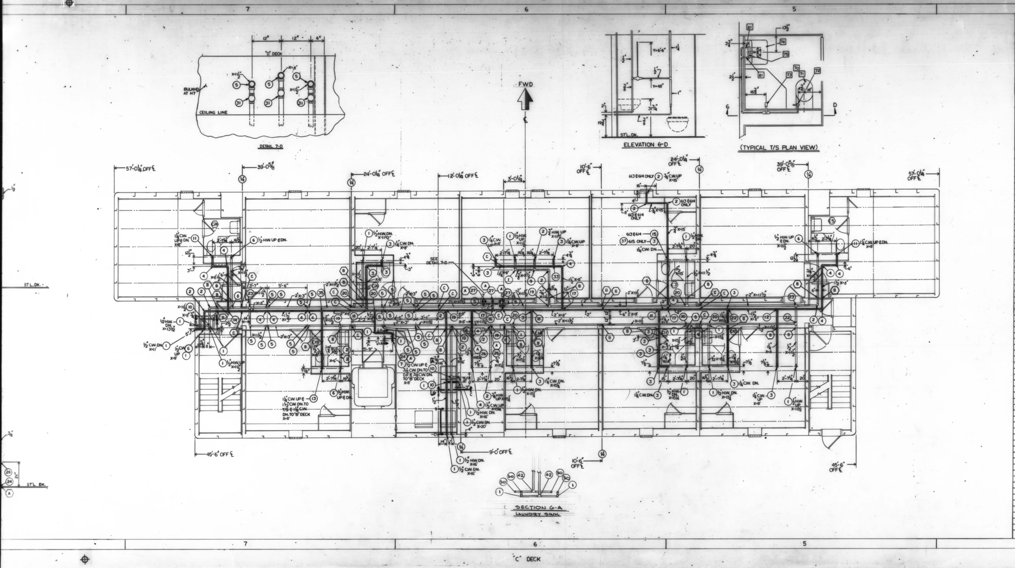
K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 1


DETAIL 7-D
"D" DECK
BULKHD AT H7
CEILING LINE
ELEVATION 6-D
ST'L DK.
(TYPICAL T/S PLAN VIEW)
FWD
℄
57'-0¼" OFF ℄
39'-0⅝"
24'-0¼" OFF ℄
12'-0¼" OFF ℄
3'-0¼"
10'-6" OFF ℄
24'-0¼" OFF ℄
39'-0⅝" OFF ℄
57'-0¼" OFF ℄
SEE DETAIL 7-D
45'-6" OFF ℄
9'-0" OFF ℄
10'-6" OFF ℄
45'-6" OFF ℄
ST'L DK.
SECTION 6-A
LAUNDRY SINK
7
6
5
4
"C" DECK

LIST OF

PIPE LIS

REV	ITEM	PART Nº	SIZE	DESCRIP
	P-1	PL-500-02	3/8"	TUBE SEAMLE
	P-2	PL-500-03	1/2"	
	P-3	PL-500-05	3/4"	
	P-4	PL-500-07	1¼"	
	P-5	PL-500-08	1½"	
	P-6	PL-500-09	2"	

MATERIAL

REV	ITEM	PART Nº	SIZE	DESCRIP
	1	PL-537-06	1/2"	ELBOW 90°
	2	PL-537-12	3/4"	
	3	PL-537-21	1¼"	
	4	PL-537-23	1½"	
	5	PL-537-25	2"	
	6	PL-546-37	1/2X1/2X3/4	TEE CXCX
	7	PL-546-41	1/2X3/8X1/2	
	8	PL-546-59	3/4X3/4X3/4	
	9	PL-546-68	3/4X1/2X3/4	
	10	PL-546-69	3/4X1/2X1/2	
	11	PL-546-95	1¼X1¼X1½	
	12	PL-547-12	1½X1½X1¼	
	13	PL-547-16	1½X1¼X1½	
	14	PL-547-26	1½X3/4X1½	
	15	PL-547-27	1½X3/4X1¼	
	16	PL-547-32	2X2X2	
	17	PL-547-34	2X2X1½	
	18	PL-547-35	2X2X1¼	
	19	PL-547-37	2X2X3/4	
	20	PL-547-38	2X2X1/2	
	21	PL-547-39	2X1½X2	
	22	PL-547-41	2X1½X1¼	
	23	PL-547-53	2X3/4X2	
	24	PL-149-53	3/8"	SLEEVE
	25	PL-149-58	3/4"	
	26	PL-149-64	1½"	
	27	PL-149-67	2"	
	28	PL-547-01	3/8X3/8X3/8	TEE CXCXF
	29	PL-562-05	1/2X1/2	ADAPTER FTG
	30	PL-568-02	1/2X1/2	ELBOW 90° C
	31	PL-070-02	2"	STOP VALVE G
	32	PL-547-54	2X1/2X2	TEE CXCXC
	33	PL-547-17	1½X1¼X1¼	
	34	PL-149-63	1¼"	SLEEVE
	35	PL-547-40	2X1½X1½	TEE CXCXC
	40	PL-560-13	1/2"	ADAPTER CXF
	41	PL-550-37	1½X1¼	REDUCER CXC
	42	PL-546-35	1/2x1/2x1/2	TEE CxCxC

FOR CONTINU
MATERIAL LIS
ZONE 10-D

2350 -1349

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

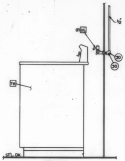
SEPT. '80

10X

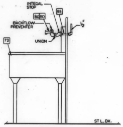
FRAME 2

MATERIAL LIST FIXTURES AND ACCESSORIES

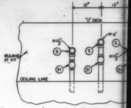
REV.	ITEM	PART Nº	SIZE	DESCRIPTION	MATERIAL	SPEC.	REMARKS
	70	PL-001-01		WATER CLOSET			CRANE #3-446 OR EQUAL
	71	PL-002-01		WATER CLOSET SEAT			
	72	PL-071-01		FLUSH VALVE			SLOAN ROYAL #110-YO OR EQUAL
	73	PL-003-01		SHOWER HEAD AND VALVE			MOENTROL BB 3170 OR EQUAL
	74	PL-004-01		LAVATORY			CRANE #1-195-S OR EQUAL
	75	PL-026-01		LAVATORY TRIM			CRANE #8-2177A OR EQUAL
	76	PL-008-01		DRINKING FOUNTAIN			EATON #WHA-12 OR EQUAL
	77	PL-006-01		SERVICE SINK			ELKAY #2520 OR EQUAL
	78			WASHING MACHINE : SEE DWG. Nº. 7600-459 LAUNDRIES ARRGT & DETAILS			
	79	PL-007-01		LAUNDRY SINK			JUST #NSFB 242 OR EQUAL
	80	PL-026-02		SERVICE & LAUNDRY SINK TRIM			CRANE #8-3757 OR EQUAL
	81	PL-025-01		LAVATORY SUPPLY			CRANE #8-5003 OR EQUAL
	82	PL-025-03	3/8"	LOOSE KEY STOP (STR.)			CRANE #8-5111 OR EQUAL
	83	PL-633-02	3/8"	UNION ELBOW 90°	CAST. BRONZE	ANSI B-16.18	FLAGG #4608 OR EQUAL
	84	PL-600-04	1/2"	ELBOW 90°	↓ ↓	↓ ↓	FLAGG #4101 OR EQUAL
	85	PL-026-04		SILL FAUCET			CHICAGO FAUCET 952 OR EQUAL
	86.	PL-602-04	1/2"	ELBOW 90° STREET	CAST BRONZE	ANSI B-16.18	FLAGG #4103 OR EQUAL
	87	PL-535-02	3/8"	RED BRASS PIPE	RED BRASS	ASTM B-43	CARTERET TO CH. PLATE
	88	PL-535-03	1/2"	↓ ↓ ↓	↓ ↓	↓ ↓	
	89	PL-535-05	1"				CARTERET TO CH. PLATE
	90						


(2) 85
1/2"
30
30
78
ST'L. DK.

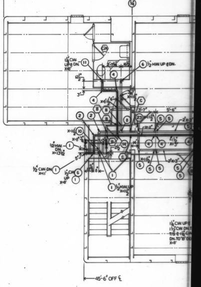
DETAIL 9-C
WASHING MACHINE

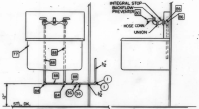

INTEGAL STOP
88
80 80
BACKFLOW PREVENTER
1/2"
UNION
79
ST L. DK.

DETAIL 8-C
LAUNDRY SINK

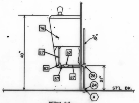

12"
12"
"D" DECK
X=11 1/2"
X=8"
BULKHD AT H7
5
5
5
31
31
31
CEILING LINE

DETAIL 7-D


57'-0 1/4" OFF ℄
39'-0 5/8"
1/4"
1 1/4" C.W. UP & DN. X=8"
11
6
1/2" H.W. UP & DN.
2'-7 1/8"
16 1/2"
12 1/2"
3"
4
C
3'-7"
5'-6"
B
23
X=11 1/2"
5
2
10
1/2" H.W. DN. X=13 1/2"
1
14
2'x3"
1/2" C.W. DN X=11"
1/2" C.W. UP X=8"
1/2" H.W. UP X=11 1/2"
45'-6" OFF ℄


INTEGRAL STOP
BACKFLOW PREVENTER
80
86
86
HOSE CONN.
UNION
77
88
88
88
88
84
84
36
36
1
1
1/2"
1/2"
12"
ST'L. DK.

SERVICE SINK
DETAIL 9-A


76
3/8"
87
82
83
87
87
28
24
A
40"
21"
ST'L. DK.

DETAIL 8-A
DRINKING FOUNTAIN

2350-1349

MICRO-MASTER 105 mm
K+E
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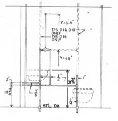
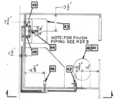
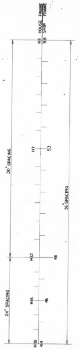
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
10X
FRAME 3



ELEVATION



(TYPICAL T/S PLAN VIEW)



FRAME SPACING

LIST OF MATERIAL

PIPE LIST

REV	ITEM	PART NO	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	P-1	PL-500-02	3/8"	TUBE SEAMLESS TYPE K	COPPER	ASTM B-88	.500 O.D.X.049 WALL
	P-2	PL- -03	1/2"	↓	↓	↓	.6250 O.D.X.049 WALL
	P-3	PL- -07	1 1/4"	↓	↓	↓	1.3750 O.D.X.065 WALL
	P-4	PL- -08	1 1/2"	↓	↓	↓	1.6250 O.D.X.072 WALL
	P-5	PL- -05	3/4"	↓	↓	↓	.875 O.D.X.065 WALL

MATERIAL LIST

REV	ITEM	PART NO	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	1	PL-537-04	3/8"	ELBOW 90° CXC	WROT COPPER	ANSI B16.22	
	2	PL-537-06	1/2"	↓	↓	↓	
	3	PL-537-21	1 1/4"	↓	↓	↓	
	4	PL-537-23	1 1/2"	↓	↓	↓	
	5	PL-568-02	1/2"	ELBOW 90° CXFPT.	BRONZE	ANSI B16.18	
	6	PL-546-39	1/2"X1/2"X3/8"	TEE CXCXC	WROT COPPER	ANSI B16.22	
	7	PL-560-13	1/2"	ADAPTER CXFPT.	↓	↓	
	8	PL-562-03	3/8"	↓ FTG.XFPT.	↓	↓	
	9	PL-149-55	1/2"	SLEEVE	STEEL GR.1015		1 1/8" O.D.X.247 W. X 3 LG.
	10	PL-149-53	3/8"	↓	↓		1" O.D.X.247 W X 3" LG.
	11	PL-149-63	1 1/4"	↓	↓		1 7/8 O.D.X.247 W X 3" LG.
	12	PL-149-64	1 1/2"	↓	↓		2 1/8 O.D.X.247 W X 3" LG.
	13	PL-149-58	3/4"	↓	↓		1 3/8 O.D.X.247 W X 3" LG.
	14	PL-556-19	1 1/2X1 1/4	FTG. REDUCER FTG.XC	WROT COPPER	ANSI-B16.22	
	15	PL-556-11	3/4X3/8"	↓	↓	↓	
	16	PL-537-12	3/4"	ELBOW 90° CXC	↓	↓	

MATERIAL LIST: FIXTURES AND ACCESSORIES

REV	ITEM	PART NO	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	40	PL-001-01		WATER CLOSET (PALACIDUS)			CRANE #3-446 OR EQUAL
	41	PL-002-01		WATER CLOSET SEAT			
	42	PL-071-01		FLUSH VALVE (ROYAL)			SLOAN ROYAL #110-Y0 OR EQUAL
	43	PL-004-01		LAVATORY (NORWICH)			CRANE #1-195-S OR EQUAL
	44	PL-026-01		LAVATORY TRIM (CAPRI)			CRANE #8-2177A OR EQUAL
	45	PL-008-01		DRINKING FOUNTAIN (WALL HUNG)			EATON #WHA-12 OR EQUAL
	46	PL-006-01		SERVICE SINK (ST. ST'L.)			ELKAY #2520 OR EQUAL
	47	PL-026-02		SINK TRIM (SERVICE SINK)			CRANE #8-3757 OR EQUAL
	48	PL-003-01		SHOWER HEAD AND VALVE			MOENTROL BB 3170 OR EQUAL
	49	PL-025-01		LAVATORY SUPPLY			CRANE #8-5003 OR EQUAL
	50	PL-025-03	3/8	LOOSE KEY STOP (STR.)			CRANE #8-5111 OR EQUAL
	51	PL-633-02	3/8"	UNION ELBOW 90°			FLAGG #4608 OR EQUAL
	52	PL-535-02	3/8"	RED BRASS PIPE	REGULAR	ASTM-B-43	CARTERET TO CH. PLATE
	53	PL-535-03	1/2"	↓	↓	↓	
	54	PL-535-05	1"	↓	↓	↓	CARTERET TO CH. PLATE
	55	PL-602-04	1/2	ELBOW STR.F.P.T. X M.P.T.	CAST BRONZE	ANSI-B-16.18	FLAGG #4103 OR EQUAL

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHO	OWNER DATE	OWNER APPD
0		SUBMITTED FOR APPROVAL			2-9-77	SHELL
A		1. INITIAL ISSUE 2. ADDED PENETRATION AND VERTICAL RUN AT HOUSE FRONT, STBD. SIDE 16'-8" OFF ℄ FOR WINDOW WASH DN. ON NAV. BR. DECK.	5-2-77	RLH	3-15-77 4-21-77	SHELL ZAPATA
B		1. PARTS LIST REVISED TO AGREE WITH REV. 2 & 3 BELOW. 6-6-77 RWM 2. LOCATION OF 1/2" C.W. UP TO NAV. BRIDGE DK. REVISED 6-6-77 R.W.M. 3. PIPING IN OVERHEAD REV. AT T/S D16 & AT DRINKING FOUNTAIN, 6-6-77	6-10-77	RLH		
C		1. T/S D1 & D29 2'-7 1/4" WAS 2'-7 3/4". 2 REV ITEM 50 TO PL 025-03	3-28-78 4-3-78	AWC AC		USSM SHANE

AUTHORITY:

GENERAL NOTES:
1 FOR GENERAL NOTES SEE REF 6
2 JOB TO TEMPLATE ALL WORK.
3 FOR INSULATION REQUIREMENTS SEE REF. 5
4. FOR MATERIAL INDICATED ☐ SEE REF 3
5 ALL PENETRATIONS THRU GIRDERS, STEEL BULKHDS., DECKS, AND DRAFT STOPS ARE INDICATED ⬡ THUS SEE REF. 6 FOR PROPER DETAIL.

NO.	REFERENCES	DWG NO.
6	TYP. PIPING INSTALL DET. & GEN. NOTES	2502-140
5	POTABLE WATER SYS. ARR. NAV. BR. DK.	2350-1352
4	POTABLE WATER SYS. ARRGT. "C" DK.	2350-1349
3	PLUMBING FIXTURE LIST	2502-138
2	DIAG. POTABLE WATER SYS. ARRGT.	2350-1343
1	DIAG. POTABLE WATER SYS. ARRGT.	2350-1342

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615	311	
614	310	
613	309	

APPROVALS
OWNERS SHELL APPL. LTR. 1429V 2-9-77 ZAPATA APPL. LTR. DATED 4-21-77 NEWPORT NEWS - APPROVAL LTR. 613C/C2350 DATED 6-2-77
ABS N.R.
USPH APPL LTR 2-4-77
USCG N.R.

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERICAL SHIP DESIGN DEPT.
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.
H.B. DWG NO.
SHT. OF.

SCALE 3/8" = 1 FT
DRAWN Bob Barber
CHECKED R.W. Salmon
SECT MGR J. T. Coquite
DATE COMPL. 11-15-76
EXAMINED -
AUTHORIZED A. CONLEY
DATE 6-30-77
TECH APPROVAL
C S D APPROVAL R.L. HARRINGTON

POTABLE WATER SYS. ARRGT. "D" DECK

U S M A DESIGN T11-S-116A
U S M A DWG NO.
HULL NO.
DWG NO. 2350-1350
REV C
SHEET NO. OF

REPRODUCTION OFFICE

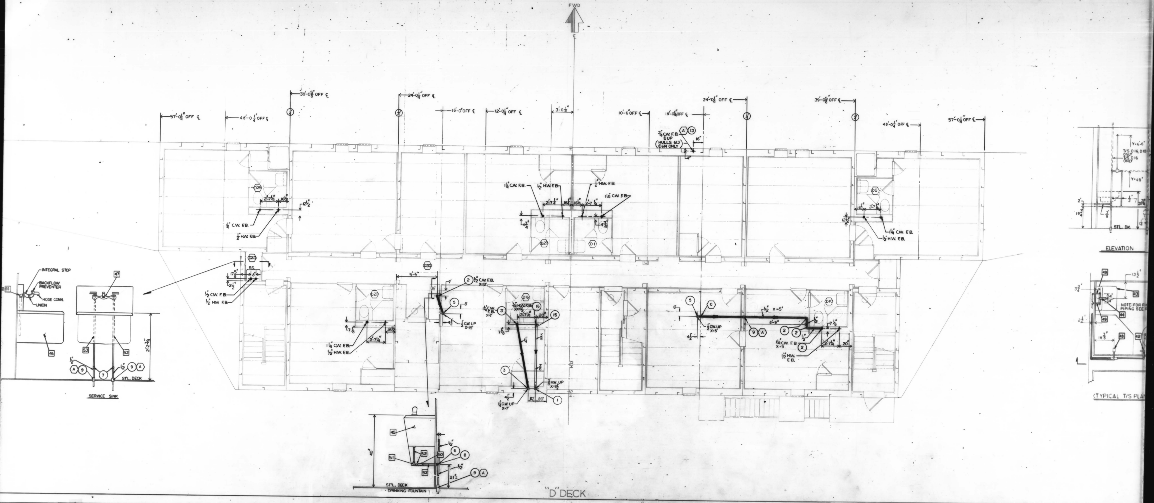
ORDERED BY DESIGN

GROUP:

2350-1350

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

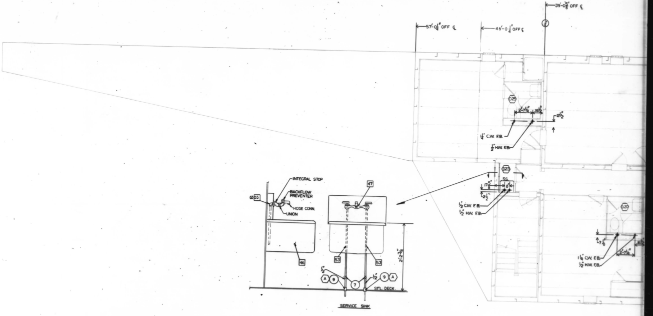
SEPT. '80
10X
FRAME 1


FWD
℄
57'-0¼" OFF ℄
48'-0¼" OFF ℄
39'-0⅝" OFF ℄
24'-0¼" OFF ℄
18'-0" OFF ℄
12'-0¼" OFF ℄
3'-0½"
10'-6" OFF ℄
18'-0" OFF ℄
24'-0¼" OFF ℄
39'-0⅝" OFF ℄
48'-0¼" OFF ℄
57'-0¼" OFF ℄
¾" C.W. F.B. & UP (HULLS 613 & 614 ONLY)
1¼" C.W. F.B.
½" H.W. F.B.
1¼" C.W. F.B.
½" H.W. F.B.
2'-7¼"
½" C.W. UP X=19'
½" C.W. UP X=5'
1¼" C.W. UP X=7'
½" H.W. UP
INTEGRAL STOP
BACKFLOW PREVENTER
HOSE CONN.
UNION
ST'L. DECK
SERVICE SINK
ST'L. DECK
DRINKING FOUNTAIN
"D" DECK
T/S D16, D10 ONLY
T/S D16 ONLY
STL. DK.
ELEVATION
NOTE: FOR F
PIPING SEE
(TYPICAL T/S PLAN

2350-1350

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
10X
FRAME 2


57'-0 1/4" OFF ℄
48'-0 1/4" OFF ℄
39'-0 5/8" OFF ℄
D25
2'-7 1/4"
16 1/2"
12 1/2"
1 1/4" C.W. F.B.
1/2" H.W. F.B.
D23
SS
17 5/8"
8"
2 1/2"
1/2" C.W. F.B.
1/2" H.W. F.B.
D20
7 1/8"
16 1/2"
2'-7 1/4"
1 1/4" C.W. F.B.
1/2" H.W. F.B.
INTEGRAL STOP
BACKFLOW PREVENTER
HOSE CONN.
UNION
(2) 55
47
46
53
53
1/2"
A
9
7
1/2"
9
A
ST'L. DECK.
2'-2 3/4"
SERVICE SINK

45
51
40"
ST'L.
DRIN

2350-1350

MICRO-MASTER 105 mm

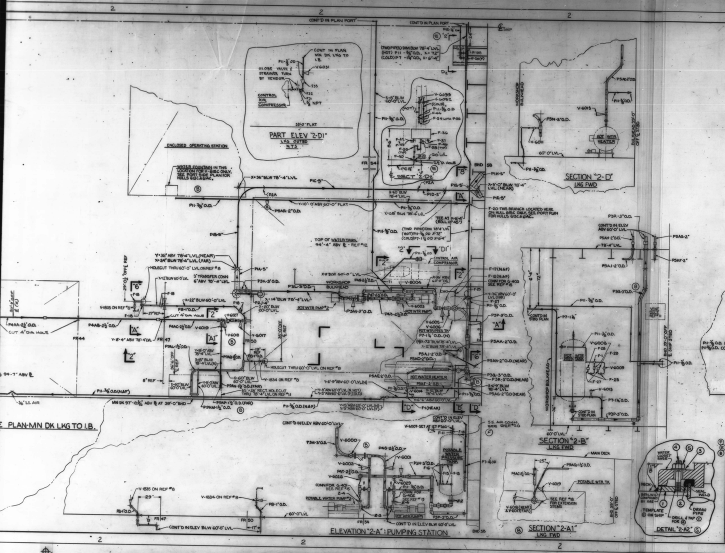
K+E

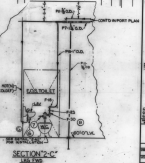
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 3


PART ELEV "2-D1"
LKG OUTBD
NTS
CONT IN PLAN MN DK LKG TO I.B.
GLOBE VALVE & STRAINER FURN BY VENDOR
CONTROL AIR COMPRESSOR
ENCLOSED OPERATING STATION
WATER FOUNTAIN IN THIS LOCATION FOR H-615C ONLY. SEE PORT SIDE PLAN FOR HULLS 613C & 614C.
CONT'D IN PLAN PORT
SECT "2-D2"
TOP OF WATER TANK 94'-4" ABV ℄ - REF #12
CONTROL AIR COMPRESSOR
WORKSHOP BULKHEAD
POT WTR PMP #2
POT WTR PMP #1
HOT WATER HEATER
F-20-THIS BRANCH LOCATED HERE ON HULL 615C ONLY. SEE PORT PLAN FOR HULLS 613C & 614C.
HOLECUT THRU 60'-0" LVL ON REF #8
3" TRANSFER CONN 6" ABV 78'-4" LVL
CUT 4" DIA HOLE
PLAN-MN DK LKG TO I.B.
SECTION "2-D"
LKG FWD
HOT WTR HEATER
WORKSHOP BULKHEAD
SECTION "2-B"
LKG FWD
POT WTR PRESS TANK
SECTION "2-A1"
LKG FWD
MAIN DECK
POTABLE WTR TK
SEE REF #18 FOR EXTENSION STEMS
ELEVATION "2-A": PUMPING STATION
POTABLE WATER PRESSURE TANK
POTABLE WATER PUMP #2
CONT'D IN ELEV BLW 60'-0" LVL
DETAIL "2-A2"
WATER CLOSET BASE
DECK
SEALING COMPOUND BY A&G
SEAL WELD
TEMPLATE ① ON SHIP
DRILL & TAP FOR ④
DRAIN PIPE


CONT'D IN PORT PLAN
E.O.S. TOILET
LAV
W.C.
SEE DETAIL "2-A2" FOR INSTALLATION
60'-0" LVL

SECTION "2-C"
LKG FWD

REVISIONS						
REV	ZONE	DESCRIPTION	NNS&DD CO DATE	AUTHD	OWNER DATE	APPD
A	ALL	INITIAL ISSUE. W.A.S.	11/12/6		—	—
B	10A,4D 2A,3A 2C,3B 4A,4B 6D 5D,8D 5A,8A 2B 2C 2B,4B 5D 4C 2B 2A1 1A	ADDED: SECT "10-A" & DET "4-D". ALTERED: Y-STRAINER WAS BRAZED. RELOCATED WATER FOUNTAINS TO SUIT E.O.S. LAYOUTS. RERAN P11-3/8" O.D. & P3R-3" O.D. TO CLEAR STRUCTURE. ALTERED P1E-5" TO CLEAR OTHER PIPING. ALTERED P1H-5", P6AL-1½" O.D., & P3Q-3" O.D., TO FIT ON THE BENDING MACHINES. F-30 WAS "F-". PIPE NUMBERS CORRECTED (1½" O.D. TUBING WAS P6.) ALTERED P9AQ-1½" O.D. (25° LEG WAS VERTICAL) AND ROLLED V-6017 & V-6018 DOWN 13° IN ORDER TO RUN EXTENSION STEMS; AND ADDED SECT "2-A1" & REF #18 FOR THIS SAME PURPOSE. THESE EXTENSION STEMS REPLACE THE 90'-0" PLATFORM, WHICH IS DELETED. W.A.S.	6/30/7		—	—
C	3D	REVISED DETAILS P4V-2½" O.D. & P4W-2½" O.D. TO SUIT 8" CONDUIT, DESIGN DEVELOPMENT. WTR	8/13/7		—	—
D	3A 3B 5D	ADDED SKETCH "3-A" INDICATED NOTCHING OF STIFF WEBBING AT 61'-0" & 48' ABV 39'-0" LVL. (PART PLAN 3B & 5D)				
	–	THE ABOVE WORK ACCOMP ON H615C.				
	–	ADDED POTABLE WTR TO CONTROL AIR COMPRESSOR FR 54-56 STBD & PART ELEV 2D1				
	–	ALT'D POTABLE WTR PIPING TO AUX DIESEL GEN FOR H 615C ONLY ELEV 4-D1	7/14/8		—	—
E	2D	STBD SIDE PLAN MN DK TO I.B.; ADDED SINK AND ASSOC. PIPING AND VALVES, SECT 2-D2 ADDED TO SUIT. AM ADDED REF 19.				
	3B 3C	PORT SIDE PLAN MN DK TO I.B.; ADDED P12-¾". ADDED PART PLAN "3-C" AM	4/27/8		—	—
F	1C	ADDED NOTE #15.				
	3B 10C 1A	ELEV BEL 60'-0" LVL, SECT "10-C" PORT SIDE PLAN MN DK - I.B.; ALT'D CONFIGURATION OF F-2, DELETED F1, F-3 & V-6022 THRU V-6025. ADDED REF TO NOTE NO. 15. ADDED REF NO. 20. WAB				
		THE ABOVE TO SUIT U.S. PUBLIC HEALTH DEPT. LTR DATED 8-2-78.	11/29/8			
G		SECTION 2-D2 DELETED F45 W/ V6032 & V6033 LAM	11/30/8			
		ADDED ① THRU ⑤ FOR INSTALLATION OF WATER CLOSET (DET 2A-2)				
H	3C	PORT SIDE PLAN MN DK TO I.B. ADDED ¾" CONN TO CARGO PUMP ROOM.	2/22/9			

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCES № 1 & № 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND THE AMERICAN BUREAU OF SHIPPING. SEE REFERENCE № 1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., THE A.B.S., AND REFERENCE № 3.
4. COUPLINGS SHOWN IN LIST OF MAT'L ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS, AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMPS, ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REFERENCE № 6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REFERENCE № 1.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REFERENCE № 4.
10. INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REFERENCE № 5.
11. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
12. ALL PIPING ON THIS DRAWING IS CLASS II.
13. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
14. ALL HOLECUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.
15. F-2 IS TO BE SIMILIAR TO CHICAGO FAUCET FITTING NO. 998 WITH VACUUM BREAKER.

REVISION APPLICABILITY			
REV	N.N. HULL №		
	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	YES
E	YES	YES	YES
F	YES	YES	NO
G	YES	YES	NO
H	YES	YES	NO

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING #10
REMARKS
DATE 2-22-7

FOR LIST OF MATERIAL, SEE DWG № 2350-1354

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS	
OWNERS	ABS NOT REQUIRED
USPH LTR DATED 8-2-78	USCG NOT REQUIRED

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

NO.	REFERENCES	DWG NO.
20	PIPING ARR SHIP'S SERVICE AIR SYS-ER ABV 60'-0" LVL	6454-556
19	ARR PLMB & SEW SYS ER BLW 60'-0" LVL	2500-2261
18	OPR GR & EXT STEMS FOR VLV IN MACH'Y SPACE-LOC & INSTL	257335
17	PIPING ARR-CNDS TRANS & DRN SYS-PLAN, SECT, & ELEV	6552-
16	PIPING ARR-EMER DSL GEN RM-PLAN, SECT, & ELEV	4002-
15	LIST OF PRESS & VAC GAGES FURNISHED BY SHIPYARD	6750-483
14	PIPING ARR-FUEL OIL SERVICE SUCTION-PLAN, SECT, & ELEV	6950-103
13	PLUMBING FIXTURES-LIST & INSTALLATION DETAILS	2502-138
12	POTABLE WATER TANK FR 50-58	1210-640
11	VENTILLATION ARR-MACH'Y SPACE-60'-0" LEVEL	2081-52
10	PIPING ARR-AUX CONDENSATE SYS-PLAN, SECT, & ELEV	6552-410
9	PIPING ARR-BOILER PRESS AUX STM-PLAN, SECT, & ELEV	6450-737
8	PIPING ARR-DISTL PLANT-PLAN, SECT, & ELEV	6557-90
7	PIPING ARR-POT WATER TK-PLAN, SECT, & ELEV	2350-1356
6	PAINTING SCHEDULE	8300-
5	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
4	TYPICAL ARRANGEMENT OF GAGE PIPING	6750-481
3	FABRICATION & WELDING INSTRUCTIONS-CL I & II PIPING	257035
2	DIAGRAM-POTABLE WATER SYSTEM-ARR	2350-1342
1	DIAGRAM-POTABLE WATER SYSTEM-LIST	2350-1343

Ⓑ HULLS 613C & 614C
△ HULL 615C ONLY

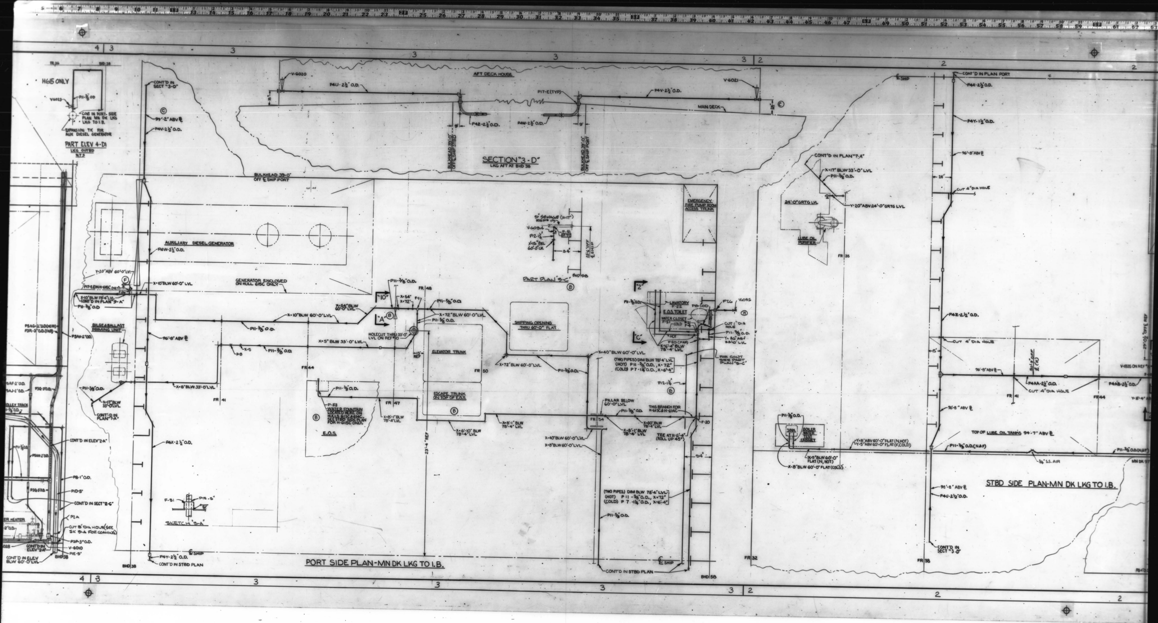
SCALE ½ INCH = 1 FT
DRAWN W.A. STARKEY
CHECKED T.E. SEAMAN
SECT MGR J. K. Johnson
DATE COMPL. 11-12-6
EXAMINED
AUTHORIZED
DATE 11-17-76
TECH APPROVAL NR
CSD APPROVAL for R.L. HARRINGTON

PIPING ARRANGEMENT - POTABLE WATER SYSTEM IN ENGINE ROOM - PLAN, SECT, & ELEV

USMA DESIGN T11-S-116a
USMA DWG NO. ~
HULL NO. ~
DWG NO. 2350-1353
REV H
SHEET NO. 1 OF 1

GROUP:

2350 - 1353
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 1


H615 ONLY
PART ELEV 4-D1
LKG OUTBD
SECTION "3-D"
LKG AFT AT BHD 38
AFT DECK HOUSE
MAIN DECK
V-6020
V-6021
P4U-2½" O.D.
P4V-2½" O.D.
P17-E (TYP)
P4Z-2½" O.D.
P4W-2½" O.D.
BULKHEAD 39'-0" OFF ℄ SHIP STBD
BULKHEAD 39'-0" OFF ℄ SHIP PORT
AUXILIARY DIESEL GENERATOR
GENERATOR ENCLOSED ON HULL 615C ONLY
BILGE & BALLAST PRIMING UNIT
EMERGENCY FIRE PUMP ROOM ACCESS TRUNK
PART PLAN "3-C"
SHIPPING OPENING THRU 60'-0" FLAT
ELEVATOR TRUNK
ESCAPE TRUNK ON TOP OF E.O.S.
E.O.S.
LAVATORY
E.O.S. TOILET
WATER CLOSET
PILLAR BELOW 60'-0" LVL
SKETCH "3-A"
PORT SIDE PLAN-MN DK LKG TO I.B.
STBD SIDE PLAN-MN DK LKG TO I.B.
24'-0" GRTG LVL
LUBE OIL PURIFIER
TOP OF LUBE OIL TANKS 94'-7" ABV ℄
BOILER WATER TEST CABINET
SINK
CONT'D IN PLAN "7-A"
CONT'D IN SECT "3-D"
CONT'D IN STBD PLAN
CONT'D IN PLAN PORT
CUT 4" DIA HOLE
FR 32
FR 38
FR 41
FR 44
FR 47
FR 48
FR 50
FR 54
BHD 38
BHD 58
℄ SHIP

2350 - 1353

MICRO-MASTER 105 mm

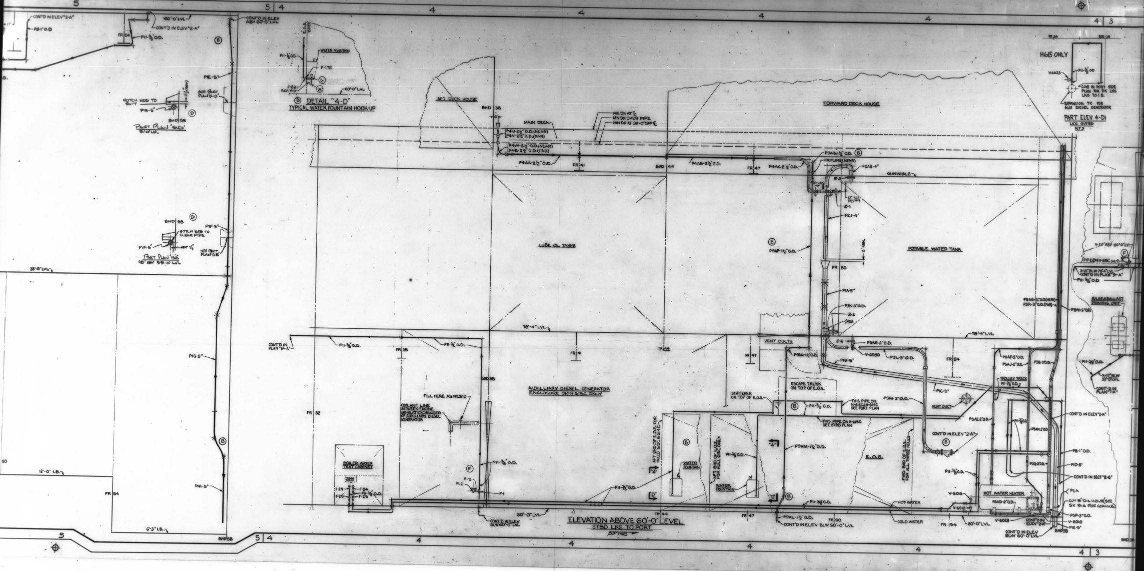
K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 2


5
5 | 4
4
4
4
4
4 | 3
CONT'D IN ELEV "2-A"
P8-1" O.D
60'-0" LVL
CONT'D IN ELEV "2-A"
FR 54
P11-3/8" O.D.
CONT'D IN ELEV ABV 60'-0" LVL
PIE-5"
NOTCH WEB TO SUIT
PIE-5"
SEE PART PLAN "5-D"
BHD 58
PART PLAN "5-D"
51'-0" LVL
BHD 58
NOTCH WEB TO CLEAR PIPE
PIF-5"
ABT 2 1/2"
PIF-5"
SEE PART PLAN "5-B"
PART PLAN "5-B"
48" ABV 33'-0" LVL
33'-0" LVL
PIG-5"
PIH-5"
FR 50
12'-0" I.B.
FR 54
6'-3" I.B.
BHD 58
E.O.S. BHD
P11-3/8" O.D.
WATER FOUNTAIN
P-17E
F-26
REF #19
60'-0" LVL
DETAIL "4-D"
TYPICAL WATER FOUNTAIN HOOK-UP
AFT DECK HOUSE
BHD 38
6"
MAIN DECK
MN DK AT ℄
MN DK OVER PIPE
MN DK AT 39'-0" OFF ℄
P4U-2 1/2" O.D. (NEAR)
P4V-2 1/2" O.D. (FAR)
P4W-2 1/2" O.D. (NEAR)
P4Z-2 1/2" O.D. (FAR)
P4AA-2 1/2" O.D.
FR 41
BHD 44
P4AB-2 1/2" O.D.
FR 47
P4AC-2 1/2" O.D.
P9AQ-1 1/2" O.D.
COUPLING (NEAR)
P2AS-4"
Z-5
GUNWHALE
12" SEE REF #7
Z-1
P2J-4"
FORWARD DECK HOUSE
LUBE OIL TANKS
P9AP-1 1/2" O.D.
2" MIN.
FR 50
POTABLE WATER TANK
P1A-5"
P3K-3" O.D.
Z-2
P2A
78'-4" LVL
78'-4" LVL
VENT DUCTS
Z-6
P5AR-2" O.D.
V-6030
P3L-3" O.D.
P9AN-1 1/2" O.D.
P1B-5"
FR 54
CONT'D IN PLAN "9-A"
P11-3/8" O.D.
P11-3/8" O.D.
FR 35
FR 41
FR 44
FR 47
FR 32
BHD 38
AUXILLIARY DIESEL GENERATOR ENCLOSURE ON H-615C ONLY
FILL HERE AS REQ'D
COOLANT LINE BETWEEN ENGINE AND HEAT EXCHANGER OF AUXILLIARY DIESEL GENERATOR
BOILER WATER TEST CABINET
SINK
F-24
F-24
F-25
F-25
P11-1/2" O.D.
P11-3/8" O.D.
F-3
F-2
F-1
60'-0" LVL
CONT'D IN ELEV BLW 60'-0" LVL
ESCAPE TRUNK ON TOP OF E.O.S.
STIFFENER ON TOP OF E.O.S.
P11-3/8" O.D.
THIS PIPE ON H-613C & H-614C SEE PORT PLAN
THIS PIPE ON H-615C SEE STBD PLAN
P3M-3" O.D.
PIC-5"
VENT DUCT
AFT BHD OF E.O.S. FOR HULLS 613C & 614C
AFT BHD OF E.O.S. FOR HULL 615C ONLY
WATER FOUNTAIN
WATER FOUNTAIN
"4"
"D"
P11-3/8" O.D.
P9AM-1 1/2" O.D.
P11-3/8" O.D.
P9AL-1 1/2" O.D.
CONT'D IN ELEV BLW 60'-0" LVL
FR 44
FR 47
FR 50
E.O.S.
FWD BHD OF E.O.S. FOR ALL THREE HULLS
HOT WATER
COLD WATER
FR 54
60'-0" LVL
CONT'D IN ELEV "2-A"
ELEVATION ABOVE 60'-0" LEVEL
STBD LKG TO PORT
FWD
P5AF-2" O.D.
P5AJ-2" O.D.
P3Q-3" O.D.
TROLLEY TRACK
P11-3/8" O.D.
P5AE-2" O.D.
P11-3/8" O.D.
P5AH-2" O.D.
P3Q-3" O.D.
CONT'D IN ELEV "2-A"
P8-1" O.D.
P1D-5"
CONT'D IN SECT "2-C"
P11-3/8" O.D.
V-6016
V-6012
HOT WATER HEATER
P5AD-2" O.D.
V-6028
CONT'D IN ELEV "2-A"
P2A
CUT 8" DIA HOLE (SEE SK 9-A FOR COAMING)
P3P-3" O.D.
V-6010
PIE-5"
BHD 58
CONT'D IN ELEV BLW 60'-0" LVL
P5AG-2" O.D. (NEAR)
P3R-3" O.D. (FAR)
P5AH-2" O.D.
FR 36
BHD 38
H615 ONLY
V6023
P11-3/8" OD
CONT IN PORT SIDE PLAN MN DK LKG LKG TO I.B.
EXPANSION TK FOR AUX DIESEL GENERATOR
PART ELEV 4-D1
LKG OUTBD
NTS
Y-20" ABV 60'-0" LVL
P17-E (ON H-615C ONLY)
F-24
X-10" BLW 78'-4" LVL
CONT'D IN PLAN "9-A"
P11-3/8" O.D
BILGE & BALLAST PRIMING UNIT
P11-3/8" O.D.
X-17" BLW 33'-0" LVL
CONT'D IN PLAN "7-A"
BHD 38

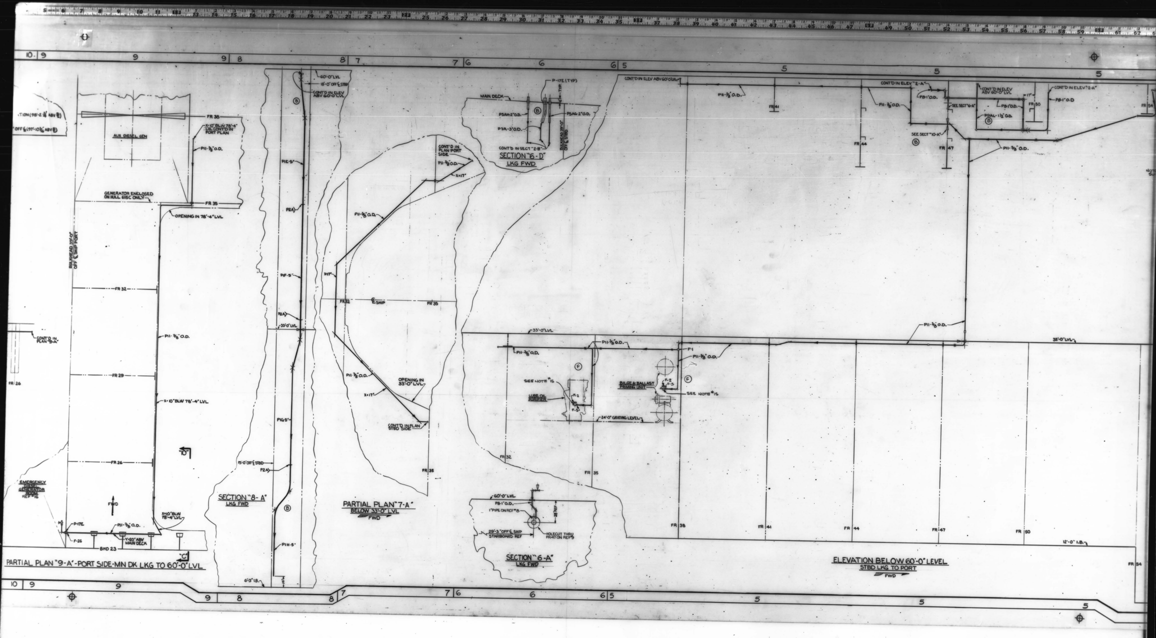
2350 - 1353

MICRO-MASTER 105 mm

SEPT. '80

10X

FRAME 3


10 | 9
9
9 | 8
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6 | 5
5
ATION (98'-2 3/8" ABV B)
OFF ℄ (97'-10 3/8" ABV B)
FR 38
AUX DIESEL GEN
X=10" BLW 78'-4" LVL CONT'D IN PORT PLAN
P11-3/8" O.D.
GENERATOR ENCLOSED ON HULL 615C ONLY
FR 35
OPENING IN 78'-4" LVL
BULKHEAD 35'-0" OFF ℄ SHIP PORT
FR 32
CONT'D IN PLAN "9-A"
P11-3/8" O.D.
FR 29
FR 26
X=10" BLW 78'-4" LVL
FR 26
"10"
EMERGENCY DIESEL GENERATOR ROOM REF #16
FWD
P-17E
F-26
Y-20" ABV MAIN DECK
P11-3/8" O.D.
X=10" BLW 78'-4" LVL
BHD 23
"C"
60'-0" LVL
15'-0" OFF ℄ STBD
CONT'D IN ELEV ABV 60'-0" LVL
B
P1E-5"
P2A
P1F-5"
P2A
33'-0" LVL
P1G-5"
15'-0" OFF ℄ STBD
P2A
B
P1H-5"
6'-3" I.B.
CONT'D IN PLAN PORT SIDE
P11-3/8" O.D.
X=17"
P11-3/8" O.D.
X=17"
FR 32
℄ SHIP
FR 35
P11-3/8" O.D.
OPENING IN 33'-0" LVL
X=17"
CONT'D IN PLAN STBD SIDE
FR 35
P-17E (TYP)
MAIN DECK
P5AH-2" O.D.
B
P5AG-2" O.D.
P5R-3" O.D.
CONT'D IN SECT "2-B"
BULKHEAD 35'-0" OFF ℄ STBD
CONT'D IN ELEV ABV 60'-0" LVL
P8-3/8" O.D.
FR 41
FR 44
CONT'D IN ELEV "2-A"
P11-3/8" O.D.
P8-1" O.D.
SEE SECT "6-A"
SEE SECT "10-A"
B
FR 47
CONT'D IN ELEV ABV 60'-0" LVL
17"
FR 50
P8-1" O.D.
P8AL-1 1/2" O.D.
B
CONT'D IN ELEV "2-A"
P8-1" O.D.
FR 54
P11-3/8" O.D.
P11-3/8" O.D.
33'-0" LVL
P11-3/8" O.D.
P11-3/8" O.D.
P-1
P11-3/8" O.D.
F
F
SEE NOTE #15
LUBE OIL PURIFIER
F-2
F-3
BILGE & BALLAST PRIMING UNIT
F-2
F-3
SEE NOTE #15
24'-0" GRATING LEVEL
33'-0" LVL
FR 32
FR 35
FR 38
FR 41
FR 44
FR 47
FR 50
12'-0" I.B.
FR 54
60'-0" LVL
P8-1" O.D.
1" PIPE ON REF #8
29'-3" OFF ℄ SHIP STARBOARD REF
HOLECUT THRU FR 47 ON REF #9
10 | 9
9
9 | 8
8 | 7
7 | 6
6
6 | 5
5
5

PARTIAL PLAN "9-A" - PORT SIDE - MN DK LKG TO 60'-0" LVL

SECTION "8-A"
LKG FWD

PARTIAL PLAN "7-A"
BELOW 33'-0" LVL
FWD

SECTION "6-D"
LKG FWD

SECTION "6-A"
LKG FWD

ELEVATION BELOW 60'-0" LEVEL
STBD LKG TO PORT
FWD

2350 - 1353

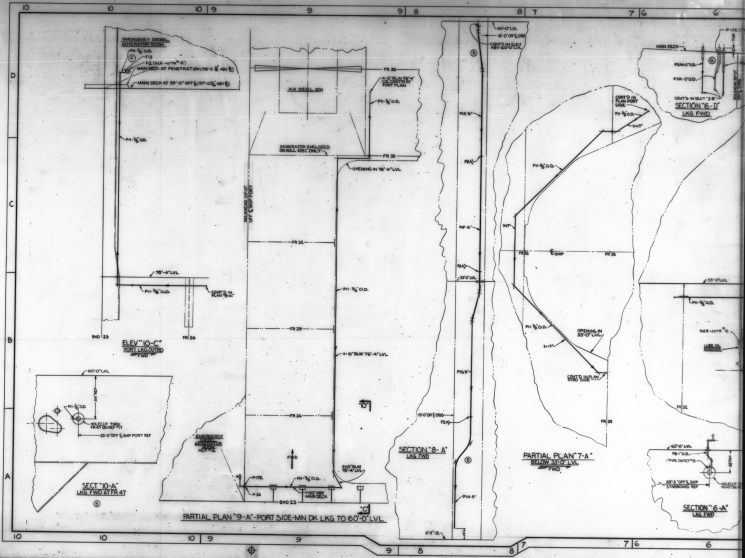
MICRO-MASTER 105 mm

K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 4


10
10
10
9
9
9
8
8
7
7
6
6
D
C
B
A
EMERGENCY DIESEL GENERATOR ROOM
P11-3/8" O.D.
F
F-3
F-2 (SEE NOTE # 15)
MAIN DECK AT PENETRATION (98'-2 3/4" ABV B)
MAIN DECK AT 39'-0" OFF ℄ (97'-10 3/16" ABV B)
P11-3/8" O.D.
78'-4" LVL
P11-3/8" O.D.
CONT'D IN PLAN "9-A"
BHD 23
FR 26
ELEV "10-C"
PORT LKG OUTBD
FWD
AUX DIESEL GEN
FR 38
X-10" BLW 78'-4" LVL CONT'D IN PORT PLAN
P11-3/8" O.D.
GENERATOR ENCLOSED ON HULL 615C ONLY
FR 35
OPENING IN 78'-4" LVL
BULKHEAD 39'-0" OFF ℄ SHIP PORT
FR 32
P11-3/8" O.D.
FR 29
X-10" BLW 78'-4" LVL
FR 26
"10"
EMERGENCY DIESEL GENERATOR ROOM REF # 16
FWD
P-17E
F-26
P11-3/8" O.D.
Y-20" ABV MAIN DECK
X-10" BLW 78'-4" LVL
BHD 23
"C"
PARTIAL PLAN "9-A" - PORT SIDE - MN DK LKG TO 60'-0" LVL
60'-0" LVL
54" REF
P11-3/8" O.D.
HOLECUT THRU FR 47 ON REF # 17
25'-0" OFF ℄ SHIP PORT REF
SECT "10-A"
LKG FWD AT FR 47
B
60'-0" LVL
18'-0" OFF ℄ STBD
CONT'D IN ELEV ABV 60'-0" LVL
B
P1E-5"
P2A
P1F-5"
P2A
33'-0" LVL
P1G-5"
15'-0" OFF ℄ STBD
P2A
B
P1H-5"
6'-3" I.B.
SECTION "8-A"
LKG FWD
CONT'D IN PLAN PORT SIDE
P11-3/8" O.D.
X=17"
P11-3/8" O.D.
X=17"
FR 32
℄ SHIP
FR 35
P11-3/8" O.D.
X=17"
OPENING IN 33'-0" LVL
CONT'D IN PLAN STBD SIDE
FR 35
PARTIAL PLAN "7-A"
BELOW 33'-0" LVL
FWD
P-17E (TY
6" TYP
MAIN DECK
B
P5AH-2" O.D.
P3R-3" O.D.
CONT'D IN SECT "2-B"
BULKHEAD 39'-0" OFF ℄ STBD
SECTION "6-D"
LKG FWD
33'-0" LVL
P11-3/8" O.D.
SEE NOTE # 15
LUBE OIL PURIFIER
FR 32
60'-0" LVL
P8-1" O.D.
1" PIPE ON REF # 8
28" REF
29'-3" OFF ℄ SHIP STARBOARD REF
HOLECUT TH FR 47 ON RE
SECTION "6-A"
LKG FWD

2350-1353

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 5

2350.1354 CSD VAULT

E

REPRODUCTION OFFICE	
YARD PRINTS	YES
REMARKS	PARTIAL ISSUE REV. L
GROUPING	YES
DATE	5-7-79
SIGNED	J.H. Johnson

YARD PRINTS — ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS																					
REV.	K	K	A	H	D	B	A	A	B	J	J	E	A	B	C	A	A	J	H	L
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	12A	12B	18

GROUP

MC NO.

PARTIAL ISSUE

615C	311		
614C	310		
613C	309	T11-S-1162	
NNS&DDCo HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C	REV	613	614
A	YES	YES	YES	K	NO	YES
B	YES	YES	YES			
C	YES	YES	YES			
D	Yes	Yes	Yes			
E	yes	yes	yes			
F	yes	yes	NO			
G	YES	YES	NO			
H	YES	YES	NO			
J	yes	yes	NO			

APPROVALS

OWNERS

ABS NOT REQ'D

USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING

INSTALLATION GROUPS 2350-0104-1001 PI, 2350-0105-1001 PI, 2350-0110-1001 PI, 2350-0115-1001 PI, 2350-0115-1002 SI, 2350-0119-1001 PI, 2350-0121-1001 SI, 2350-1701-1001, SI

PIPING ARR 2350-1353
PIPE DET 2350-1355

SCALE NTS =1 Ft.
DRAWN W.A. STARKEY
CHECKED T.E. SEAMAN
SECT. MGR. J.H. Johnson
DATE COMPL. 11-12-76
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 11-12-76
TECH. APPROVAL NOT REQ'D
CSD APPROVAL EES for R.L. HARRINGTON

GROUPED BY / CHK.
DATES COMP. / PART
HULL 613C GROUP NO. / KEY
TYPE OF DWG. —

TITLE PIPING ARR POT WATER SYS IN E.R. L/M 1020 1003

DWG. NO. 2350-1354 REV L SHEET NO. 1 OF 17

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	AUTH'D	OWNER DATE	APP'D.
A	1-17	INITIAL ISSUE	11/12/76	JHJ	—	—
B	11 12 6,9,&14	QTY LINE 17 WAS 2. ADDED LINE 11. ALTERED PIPE Nº TO CORRECT ERROR (ALL P9 PIPING WAS P6) KRS	4/30/7		—	—
C	15 15	QTY LINE 3 WAS 14 ADDED LINE 6 WTR	10/17/7		—	—
D	5 10 10 12 16	ADDED LINE NO. 8 (WORK ACCOMP ON H613C. ALT'D LINE 13-WAS FOR H613, 614 & 615 ADDED LINE 17 & 18 ADDED LINE 12, 13 & 14 LINE 3 SOURCE WAS 15-06-198E	3/14/8		—	—
E	12 12A 10 11	ADDED L'S 15 THRU 18. ADDED SHT 12-A ADDED LINE NO. 4 - QTY OF LN 3 WAS 475'-0 QTY OF LINE #1 & #11 WAS 6 & 2 RESP.	4/24/8		—	—
F	4 10 11 11	QTY OF LINE 4 WAS 3. ALT'D DESCRIPTION OF LINE 5. DELETED LINES 7, 11 & 12. DELETED LINES 12 & 13. QTY OF LINE 1 WAS 7. ALT'D DESCRIPTION OF LINE 2. QTY OF LINE 13 WAS 3. THE ABOVE TO SUIT U.S.P.H. LTR DATED 8-2-77 QTY OF LINE 5 WAS 2. TO SUIT SHIP INSTL	8/24/8			
G	12A	ADDED LINE 16, 17 & 18 LAM				
H	12A 4 11	LINE 7 WAS 3/8 OD PARKER UNION LINE 8 & 9 WERE 1/4 GL STOP VALVE THD LINE 11 DELETED LAM LINE 5- SOURCE WAS "FURN BY HOPEMAN" ↓ 2 ↓ ↓ ↓	11/30/8			
	12B	ADDED LINES 1-7				
J	10 11 12A	QTY OF L. 3 WAS 495'-0" QTY OF L. 4 WAS 40, QTY OF L. 17 WAS 3. ADDED L. 13 (WORK ACCOMP ON 613C BY LIAISON NO. LNC-NO. 73)	2/22/9			
K	18	ADDED TO SUIT J.O. 2040-L1 JGB	5/7/79			
L	18	LINE 10 SOURCE WAS 2500-C30 ⑧				

NOTES:

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION, SEE REF 1.

NO.	REFERENCES	DWG. NO.
1	DIAG POTABLE WATER SYS - LIST	2350-1343

HULL NO. 613C, 614C, 615C DWG. NO. 2350-1354 REV K SHEET 2 OF —

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P1G	5" IPS X STD THK PIPE STL	PIPE DET 2350-1355	PS	
	2	1	P1H	↓	↓	↓	
	3	7'-0"	P11	.500" OD X .035" THK PIPE COPPER	PO ① 2350-C9	MD-PS	
	4						
	5						
	6	3	H-2	5" FIXED HGR (NO LINER)	3/ 25-41-422	ST-PS	
	7	2	H-15	3/8" OD FIXED HGR (1/16" SYN RUBBER LINER)	3/ 25-49-802	↓	
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - P.W. SYS IN ER

PS-157

GROUP NO. 2350-0104-1001 PI SHT 1 OF 1

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 3 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	95'-0"	P11	.500" OD X .035" THK PIPE COPPER	PO ① 2350-C9	MD-PS	
	2						
	3						
F	4	1	F-1	3/8" OD TEE COPPER SIL-BRZ MUELLER WT600 OR=	PO ⑥ 2350-C8	MD-PS	
H	5	2	F-2	3/4" FAUCET W/ VACUUM BREAKER SCR'D BRZ	PO ① 2350-C17	PS	
	6	2	F-3	3/4" MPT X 3/8" OD SIL-BRZ ADAPTER BRONZE MUELLER WC-901 OR=	PO ⑦ 2350-C8	MD-PS	
F	7	~~2~~	~~F-4~~	~~1/2" X 3/8" FLUSH BUSHING COPPER SIL-BRZ MUELLER WC-100 OR =~~	⑧ ↓	↓	
	8	6	F5	3/8" COUPLING COPPER SIL-BRZ MUELLER WC 400	PO ⑫ 2350-C4		
	9						
	10						
F	11	~~1~~	~~V6024~~	~~1/2" OD SIL-BRZ X 3/4" HOSE THD VLV BRONZE MUELLER V-1824 OR =~~	~~PO ⑳ 2350-C8~~	~~MD-PS~~	
F	12	~~1~~	~~V6025~~	~~↓~~	~~⑳ ↓~~	~~↓~~	
	13	1					
	14						
	15	20	H-15	3/8" OD FIXED HGR (1/16" SYN RUBBER LINER)	3/ 25-49-802	ST-PS	
	16						
	17						
	18						

REMARKS -

SERVICE - P.W. SYS IN E.R.

PS-159

GROUP NO. 2350-0105-1001 PI SHT 1 OF 1

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 4 REV. H

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P1E	5" IPS X STD THK PIPE STL	PIPE DET 2350-1355	PS	
	2	1	P1F	↓	↓	↓	
	3						
	4						
	5	3	H-2	5" FIXED HGR (NO LINER)	3/ 25-41-922	ST-PS	
	6						
	7						
D	8	1	F-31	PIPE COAMING (MAKE FROM 8" IPS X STD THK (6 4")	3/ 57-06-116	ST-PS	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - P.W. SYS IN E.R.

PS-159

GROUP NO. 2350-0110-1001 PI SHT 1 OF 1

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 5 REV. D

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P3N	3.125" OD X .090" THK PIPE COPPER	PIPE DET 2350-1355	PS	
	2	1	P3P	↓	↓	↓	
	3	1	P4S	2.625" OD X .080" THK	↓	↓	
	4	1	P4T	↓	↓	↓	
	5	1	P5AD	2.125" OD X .070" THK	↓	↓	
B	6	1	P9AL	1.625" OD X .060" THK	↓	↓	
	7	30'-0"	P8	1.125" OD X .050" THK	PO ② 2350-C9	MD-PS	
	8	70'-0"	P11	.500" OD X .035" THK	① ↓	↓	
	9						
	10	1	V6001	2 1/2" OD GATE 125# BRONZE SIL-BRZ MUELLER V1009 OR=	PIPE DET 2350-1355	PS	
	11	1	V6002	↓	↓	↓	
	12	1	V6003	↓	↓	↓	
	13	1	V6004	↓	↓	↓	
	14	1	V6005	3" OD	↓	↓	
	15	1	V6006	3/4" OD SIL-BRZ X 3/4" HOSE THD VLV BRONZE MUELLER V1024 OR=	↓	↓	
	16	1	V6007	1" RELIEF BRONZE SCRD (BUSH TO 3/4") SET AT 127 PSI	S 26-16-164 S 25-05-136	ST-PS	
	17	1	V6010	2" OD GATE 125# BRONZE SIL-BRZ MUELLER V1009 OR =	PIPE DET 2350-1355	PS	
	18	1	V6011	3/8" OD	↓	↓	

REMARKS -

SERVICE - P.W. SYS IN E.R.

PS. 161

GROUP NO. 2350-0115-1001 PI SHT 1 OF 3

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 6 REV. B

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V6029	2 1/2" OD SWING CHECK BRONZE SIL-BRZ MUELLER V1007 OR=	PIPE DET 2350-1355	PS	
	2	1	V6026	↓	↓	↓	
	3	1	V6028	2" OD	↓	↓	
	4						
	5	5	F-5	3/8" OD COUPLING COPPER SIL-BRZ MUELLER WC 400 OR=	PO ⑫ 2350-C4	MD-PS	
	6	1	F-11	1/2" IPS X STD THK BRASS NIPPLE THD L=3"	3/ 25-14-086E	ST-PS	
	7	3	F-12	3/4" IPS L=3"	3/ 25-14-113E	↓	
	8	2	F-13	↓ L=6"	3/ 25-14-125E	↓	
	9	1	F-14	3/4" X 1/2" RED COUPLING BRONZE SCRD	3/ 25-07-258	↓	
	10	2	F-15	3/4" COUPLING ↓	PO ⑦ 2350-C4	MD-PS	
	11	1	F-16	3/4" GAGE GLASS SCRD	PO. ① 6552-C5	↓	
	12	2	F-17	3/4" ELL 90° BRONZE SCRD	3/ 25-09-138	ST-PS	
	13	6	F-18	1" ELL 90° COPPER SIL-BRZ MUELLER WE 500 OR =	PO ⑨ 2350-C8	MD-PS	
	14						
	15	8	H-15	2 5/8" & 3" OD FIXED HGR (1/16" SYN RUBBER LINER)	3/ 25-49-822	ST-PS	
	16	2	H-15	2" OD ↓	3/ 25-49-814	↓	
	17	3	H-15	1 1/2" OD ↓	3/ 25-49-812	↓	
	18	23	H-15	3/8" & 1/2" OD (1/16" SYN RUBBER LINER)	3/ 25-49-802	↓	

REMARKS -

SERVICE - P.W. SYS IN ER.

PS-161

GROUP NO. 2350-0115-1001 PI SHT 1 OF 3

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 7 REV. A

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	4	Z-2	3"	BOLTS	5/8" HVY HEX HEAD L=2 1/2"	PO 6000-C7 ㉗	MD-PS	
	2	4			NUTS	5/8" HVY HEX	PO 6000-C12 ⑱	↓	
	3	1			GSKT	1/16" RUBBER 150#	3/ 15-02-200E	ST-PS	
	4	8	Z-3	1 1/4"	BOLTS	1/2" HVY HEX HEAD L=1"	PO 6000-C12 ㉕	MD-PS	
	5	—			NUTS	—	—		
	6	2			GSKT	1/16" RUBBER 150#	3/ 15-02-192E	ST-PS	
	7	8	Z-4	1"	BOLTS	1/2" HVY HEX HEAD L=1 1/2"	PO 6000-C12 ㉔	MD-PS	
	8	8			NUTS	1/2" HVY HEX	PO 6000-C11 ①	↓	
	9	2			GSKT	1/16" RUBBER 150#	3/ 15-02-190E	ST-PS	
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - P.W. SYS IN E.R.

PS-161

GROUP NO. 2350-0115-1001 PI SHT 8 OF 3

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 8 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P1A	5" IPS X STD THK PIPE STL	PIPE DET 2350-1355	PS	
	2	1	P1B	↓	↓	↓	
	3	1	P1C	↓	↓	↓	
	4	1	P1D	↓	↓	↓	
	5	1	P2J	4" IPS X .119" THK PIPE 90:10 CU-NI	↓	↓	
	6	1	P3K	3.125" OD X .090" THK PIPE COPPER	↓	↓	
	7	1	P3L	↓	↓	↓	
	8	1	P3M	↓	↓	↓	
	9	1	P3Q	↓	↓	↓	
	10	1	P5AE	2.125" OD X .070" THK	↓	↓	
	11	1	P5AF	↓	↓	↓	
	12	1	P5AJ	↓	↓	↓	
	13	1	P5AK	↓	↓	↓	
B	14	1	P9AM	1.625" OD X .060" THK	↓	↓	
B	15	1	P9AN	↓	↓	↓	
B	16	1	P9AP	↓	↓	↓	
	17	1	P5AR	2.125" OD X .070" THK	↓	↓	
	18						

REMARKS -

SERVICE - P.W. SYS IN ER.

PS-167

GROUP NO. 2350-0115-1002 SI SHT 1 OF 5

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 9 REV. B

2350-1354

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
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SEPT. '80

FRAME

8X

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	70'-0"	P7	1.375"OD X .055" THK PIPE COPPER	PO ③ 2350-C9	MD-PS	
	2	35'-0"	P-8	1.125" OD X .050" THK	PO ② 2350-C9		
J	3	620'-0"	P-11	.500" OD X .035" THK	PO ① 2350-C9		
E	4	36'-0"	P-12	1¼" IPS X X-HVY STL PIPE	S/ 57-07-105		
	5						
	6	1	V6000	3"OD GATE 125# BRONZE SIL-BRZ MUELLER V1009 OR =	PIPE DET 2350-1355	PS	
	7	1	V6012	3/8"	PO ⑨ 2350-C3	MD-PS	
	8	1	V6013	1⅛"OD	PO ⑮ 2350-C3		
	9	1	V6014	3/8"OD	⑨		
	10	1	V6015	2"OD	PIPE DET 2350-1355	PS	
	11	1	V6016	3/8"OD	PO ⑨ 2350-C3	MD-PS	
F	12	~~1~~	~~V6022~~	~~½" SIL-BRZ X ¾" HOSE THD VLV BRONZE MUELLER V-1024 OR =~~	~~PO ⑳ 2350-C8~~		
F	13	~~1~~	~~V6023~~		~~H 613 & 614C ONLY~~		
	14	1	V6030	2"OD GATE 125# BRONZE SIL-BRZ MUELLER V1009 OR =	PIPE DET 2350-1355	PS	
	15	1	V6008	3/8"OD GATE 125# BRONZE SIL-BRZ MUELLER V1009 OR =	PO ⑨ 2350-C3 -	MD-PS	
	16	1	V6009		⑨		
D	17	1	V6023		H 615 C ONLY ① 2350-C11		
D	18	1	V6031				

REMARKS –

SERVICE – P.W. SYS IN E.R.

GROUP NO. PS-167 2350-0115-1002 SI SHT 2 OF 5

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 10 REV. J

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
F	1	5	F-1	3/8"OD TEE COPPER SIL-BRZ MUELLER WT600 OR =	PO ⑥ 2350-C8	MD-PS	
H	2	2	F-2	¾" FAUCET W/VACUUM BREAKER SCR'D BRZ	PO ① 2350-C17	PS	
	3	2	F-3	¾"MPT X 3/8"OD SIL-BRZ ADAPTER BRONZE MUELLER WC401 OR =	PO ⑦ 2350-C8	MD-PS	
J	4	44	F-5	3/8"OD COUPLING COPPER SIL-BRZ MUELLER WC400 OR =	⑩		
F	5	5	F-6	3"OD	PO ⑩ 2350-C4		
	6	4	F-8	1½"OD	PO ⑰ 2350-C8		
	7	5	F-9	1⅛"OD	⑱		
	8	1	F-10	1"OD	PO ⑨ 2350-C4		
	9	1	F-18	1"OD ELL 90° COPPER SIL-BRZ MUELLER WE500 OR =	PO ⑨ 2350-C8		
	10	4	F-19	2"OD COUPLING COPPER SIL-BRZ MUELLER WC400 OR =	PO ⑧ 2350-C4		
J	11	4	F-20	1⅛"X1⅛"X3/8" OD TEE COPPER SIL-BRZ MUELLER WT600 OR =	PO ⑪ 2350-C8		
	12	1	F-21	1⅛"X1"X½" OD	⑫		
F	13	1	F-4	½"OD X 3/8" FLUSH BUSHING COPPER SIL-BRZ MUELLER WC106 OR =	⑬		
	14	1	F-23	1"OD UNION BRONZE SIL-BRZ MUELLER C107 OR =	⑭		
	15	2	F-24	½"MPT X 3/8"OD SIL-BRZ ADAPTER BRONZE MUELLER WC401 OR =	⑮		
	16	5	F-25	3/8"OD UNION BRONZE SIL-BRZ MUELLER C107 OR =	⑯		
J	17	4	F-26	3/8"OD BHD SLEEVE STL ㊱ 216522	M.O. 283097 S-2 L-5	ST-PS	
	18	3	F-27	½"MPT X 3/8"OD SIL-BRZ ADAPTER BRONZE MUELLER WC401 OR =	P.O. ⑲ 2350-C8	MD-PS	

REMARKS –

SERVICE – P.W. SYS IN ER.

GROUP NO. PS-167 2350-0115-1002 SI SHT 3 OF 5

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 11 REV. J

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	6	H-2	5" FIXED HGR (NO LINER)	S/ 25-41-422	ST-PS	
	2	2	H-2	4" (⅛" SYN RUBBER LINER)	S/ 25-41-416		
	3	6	H-15	3"OD	S/ 25-49-822		
	4	6	H-15	2"OD	S/ 25-49-819		
	5	16	H-15	1⅛"OD	S/ 25-49-812		
	6	105	H-15	1⅛"OD (⅛" SYN RUBBER LINER)	S/ 25-49-802		
	7						
	8						
	9	1	F28	PRESSURE SWITCH 80 PSI INCREASING - 55 DECREASING	PO (13C) 6350-C15	MD-PS	
	10	1	F29	PRESSURE SWITCH 80 PSI INCREASING - 50 DECREASING	(13-D)		
B	11	1	F-30	ADAPTOR COUPLING, 1" O.D. FEMALE SIL BRZ × 1" I.P.S. MALE SCREWED, MUELLER WC-401 OR =	MO 283173 S 3 L 7	ST-PS	
D	12	1	F 31	3/8 IPS × STD THK BRASS NIPPLE THD L = 2"	S/ 25-14-058E		
D	13	1	F 32	3/8" 90° ELL BRASS THD	S/ 25-09-132		
D	14	1	F 33	3/8" FUNNEL COPPER	MO 257341 SHT 9 L. 1		
E	15	2	F34	FAUCET ½" COMPRESS.	S/ 13-02-170	ST-PS	
E	16	2	F35	½" FPT X 3/8" OD SIL-BRZ ADAPTER BRONZE	MO 216707-6 S11. L.7		
E	17	1	F36	SINK	MO 216707-6 S11. L.1		
E	18	2	F37	3" X 3" X ¼" L 44" LONG STEEL	S/ 13-05-238		

REMARKS –

SERVICE – P.W. SYS IN E.R.

GROUP NO. PS-167 2350-0115-1002 SI SHT 4 OF 5

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 12 REV. E

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	2	F-38	1¼" UNION MI SCREWED 300#	S/ 25-12-170	ST-PS	
	2	4	F-39	1¼" ELL 90° SCREWED MI	S/ 25-09-240		
	3	1	F-40	1¼" DK SLEEVE STL	S/ 25-20-389		
	4	1	F-41	1¼" BOSS S.W STL	S/ 25-02-228		
	5	4	F-42	½" BOLT STL ZINC PLT L = 1½"	97-60-454		
	6	4	F-43	½" NUT HEX HD STL	S/ 97-64-054		
H	7	2	F-44	3/8 OD UNION BRONZE SIL-BRZ MUELLER C107 OR =	⑯ 2350-C8		
H	8	1	V6032	3/8 O.D. GATE 125# BRONZE SIL-BRZ MUELLER V1009 OR =	⑨ 2350-C3		
H	9	1	V6033				
	10	1	V6034	1¼" SWING CHK BRONZE 125#	S/ 26-07-110		
H	11	~~4~~	~~F-45~~	~~3/8" X ¼" CONNECTOR-MALE PARKER FTG 6 FBTX~~	~~S/ 25-21-306~~		
	12	1	F-46	1¼" THD NIPPLE STL L = 3"	S/ 25-14-420E		
J	13	1	V6035	3/8" O.D. GATE 125# BRONZE SIL-BRZ MUELLER V1009 OR =	⑨ 2350-C3		
	14						
	15						
G	16	1	F51	WATER CLOSET (DECK MOUNTED)	FURN BY HOPEMAN	—	
G	17	1	F52	LAVATORY		—	
G	18	1	F53	WATER FOUNTAIN		—	

REMARKS –

SERVICE – P.W. SYS IN E.R.

GROUP NO. PS-167 2350-0115-1002 SI

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 12A REV. J

INSTALLATION GROUP

NN 3569

REV.	LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	①	3/8" THK STEEL PLATE 18" X 24"	S/ 72-40-370	OA-PS	
	2	1	②	SETTING SEAL	S/ 13-03-190	ST-PS	
	3	4	③	WASHERS ¼" CHROME PLATED	S/ 13-03-212		
	4	4	④	BOLTS, BRASS CLOSET ¼" X 2¼" LONG	S/ 13-03-206		
	5	4	⑤	¼" HEX NUT BRASS	S/ 21-20-100		
	6	3	⑥	STOPS, STRAIGHT PATTERN 3/8" I.P.S.	S/ 13-02-140		
	7	1	⑦	FLUSH VALUE	S/ 13-02-230		
	8	1	⑧	1¼" "P" TRAP	S 13-03-130		
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS –

SERVICE – P.W. SYS IN E.R.

GROUP NO. OA-166 PS-167 2350-0115-1002 SI

APPLICABLE HULLS 613C 614C

DWG NO. 2350-1354 SHEET 12B REV. H

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	4	Z-2	3"	BOLTS	5/8" HVY HEX HEAD L = 2½"	PO 6000-C7 ㉗	MD-PS	
	2	4			NUTS	5/8" HVY HEX	PO 6000-C12 ⑱		
	3	1			GSKT	1/16" RUBBER 150#	S/ 15-02-200E	ST-PS	
	4	8	Z-5	4"	BOLTS	5/8" HVY HEX HEAD L = 2¾"	PO 6000-C7 ㉖	MD-PS	
	5	8			NUTS	5/8" HVY HEX	PO 6000-C12 ⑱		
	6	1			GSKT	1/16" RUBBER 150#	S/ 15-02-204E	ST-PS	
	7	4	Z-6	2"	BOLTS	5/8" HVY HEX HEAD L = 2¼"	PO 6000-C7 ㉘	MD-PS	
	8	4			NUTS	5/8" HVY HEX	PO 6000-C12 ⑱		
	9	1			GSKT	1/16" RUBBER 150#	S/ 15-02-196E	ST-PS	
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –

SERVICE – P.W. SYS IN ER

GROUP NO. PS-167 2350-0115-1002 SI SHT 5 OF 5

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 13 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P3R	3.125"OD X .090" THK PIPE COPPER	PIPE DET 2350-1355	PS	
	2	1	P4W	2.625" OD X .080" THK			
	3	1	P4X				
	4	1	P4Y				
	5	1	P4Z				
	6	1	P4AA				
	7	1	P4AB				
	8	1	P4AC				
	9	1	P5AG	2.125"OD X .070" THK			
	10	1	P5AH				
B	11	1	P9AQ	1.625"OD X .060" THK			
	12						
	13	1	V6017	2½"OD GATE 125# BRONZE SIL-BRZ MUELLER V-1009 OR =	PIPE DET 2350-1355	PS	
	14	1	V6018				
	15	1	V6019	1½"OD			
	16	1	V6027	1½"OD SWING CHK 125# BRONZE SIL-BRZ MUELLER V-1007 OR =			
	17						
	18						

REMARKS –

SERVICE – P.W. SYS IN ER.

GROUP NO. PS-155 2350-0119-1001 PI SHT 1 OF 3

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 14 REV. B

GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	5	F-7	2½"OD COUPLING COPPER SIL-BRZ MUELLER WC400 OR =	PO ⑪ 2350-C4	MD-PS	
	2						
C	3	12	H-15	3"~~&~~2½"OD FIXED HGR (⅛" SYN RUBBER LINER)	S/ 25-49-822	ST-PS	
	4	4	H-15	2"	S/ 25-49-814		
	5	2	H-15	1½"	S/ 25-49-812		
C	6	2	H-15	2½" OD FIXED HGR (⅛" SYN RUBBER LINER)	S/ 25-49-824		
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS –

SERVICE – P.W. SYS IN ER

GROUP NO. PS-155 2350-0119-1001 PI SHT 1 OF 3

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 15 REV. C

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	4	Z-1	2½"	BOLTS	5/8" HVY HEX HEAD L = 2"	PO 6080 2350-C25 ㉑	MD-PS	
	2	4			NUTS	5/8" HVY HEX	PO 6000-C12 ⑱		
	3	1			GSKT	1/16" RUBBER 150#	S/ 15-02-198E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –

SERVICE – P.W. SYS IN E.R.

GROUP NO. PS-155 2350-0119-1001 PI SHT 3 OF 3

APPLICABLE HULLS 613C 614C 615C

DWG NO. 2350-1354 SHEET 16 REV. D

2350-1354

MICRO-MASTER® 105 mm
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SEPT. '80

FRAME

8X

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P4U	2.625"OD X.080"THK PIPE COPPER	PIPE DET 2350-1355	PS	
		2	1	P4V	↓ ↓ ↓	↓	↓	
		3						
		4						
		5	1	V6020	2½"OD GATE 125# BRONZE SIL-BRZ MUELLER V1009 OR=	PIPE DET 2350-1355	PS	
		6	1	V6021	↓ ↓	↓	↓	
		7						
		8						
		9	4	H-15	2½"OD FIXED HGR(¼"SYN RUBBER LINER)	2/ 25-49-822	ST-PS	
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

PS- 158

SERVICE - P.W. SYS IN E.R.

								GROUP NO.	2350-0121-1001 SI SHT 1 OF 1		
APPLICABLE HULLS	G13C	G14C	G15C						DWG NO. 2350-1354	SHEET 17	REV. A

OUTFITTING GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
K		1	15'-0	P13	.50 O.D. x .035 THK. CU. TUBING	57-16-224	ST-PS	
K		2	2	P14	.675 O.D.x .091 THK. BRASS, 6 LG, CHROME PLATED, THD. ONE END	SY/57-01-102	↓	
		3						
		4		FITTING NO.				
K		5	1	F-54	2x2x3/8 RED. TEE, WROT CU, ASTM-B75, SIM. MUEL. W40108	P.O. 2500-C30 ⑤	ST-PS	
↓		6	1	F-55	3x3x3/4 RED. TEE, WROT CU, ASTM-B75, SIM. MUEL. W40146	↓ ⑥	↓	
↓		7	1	F-56	3/4x3/8 RED. BUSH, MxF, WROT CU, ASTM-B75, SIM. MUEL. W1327	↓ ⑦	↓	
↓		8	2	F-57	3/8 45°ELL, WROT CU, ASTM-B75, SIM. MUEL. W3021	↓ ⑧	↓	
↓		9	2	F-58	3/8 90°ELL, WROT CU, ASTM-B75, SIM. MUEL. W2017	25-21-531	↓	
L		10	1	F-59	LAV. TRIM, SET (FAUCETS)	P.O. 2500-C31 ③	↓	
K		11	1	F-60	LAV. SUPPLY (CUTOFF)	P.O. 2500-C31 ②	↓	
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

PS-HC 188

SERVICE - POT. WTR. TO GALLEY SINK

								GROUP NO.	2350-1701-1001-SI		
APPLICABLE HULLS	G14C YES								DWG NO. 2350-1354	SHEET 18	REV. L

2350-1354

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
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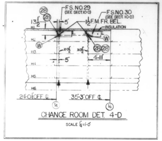
SEPT. '80

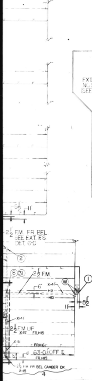
FRAME

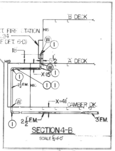
8X



CHANGE ROOM DET. 4-D

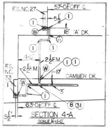
SCALE ¼"=1'-0"





SECTION 4-B

SCALE ¼"=1'-0"



SECTION 4-A

SCALE ¼"=1'-0"

LIST OF MATERIAL

REV.	ITEM NO.	PART NO.	SIZE	DESCRIPTION	MATERIAL	SPEC.	REMARKS
				PIPE LIST			
	P1	PL-110-7	1½	PIPE - CARBON STEEL (BLACK)	SCH. 80	ASTM-A-53 TYPE 'E' S OR 'F'	
	P2	9	2½				
	P3	10	3"				
	P4	12	4"				
	P5	13	5"				
	P6	↓ 14	6"	↓	↓	↓	
				FITTING LIST			
	1	PL-250-3	2½	ELBOW 90° SHORT RADIUS BUTTWELD	WROUGHT STEEL BLACK SCH. 80	ASTM-A-234 ANSI-B-16.28	
	2	PL-250-4	3"			GR.'B' W.P.B. 150#	
	3	PL-250-6	4"				
	4	PL-250-7	5"				
	5	PL-250-8	6"	↓		↓	
	6	PL-253-7	3"X2½	↓		ASTM A 234 ANSI-B-16.9	
	7	PL-262-14	4X4X2½	TEE - REDUCING		GR.'B' W.P.B. 150#	
	8	PL-262-5	3X3X2½	TEE - REDUCING			
	9	PL-262-17	4"	TEE - STRAIGHT ↓			
	10	PL-266-33	4"X3"	REDUCER CONCENTRIC BUTT WELD			
	11	PL-266-39	5"X4"				
	12	PL-266-43	6"X4"	↓	↓	↓	
	13	PL-050-1	1½	VALVE			FURNISHED & INST. BY N.N.
	14	PL-050-2	2½				
	15	PL-050-3	5"				
	16	PL-050-4	6"	↓			↓
	17	PL-050-5		EXTERIOR FIRE STATION WITH CLIPS, BRACKETS AND RACKS FOR 2½ FIREMAIN			FURNISHED BY N.N.
	18	PL-051-01	1½	FLANGE-SLIP ON 150#	FORGED STEEL	ASTM-A-105 ANSI B16.5	FLAT FACE
	19	PL-C51-02	2½	FLANGE SLIP ON 150#	FORGED STEEL	ASTM-A-105 ANSI B16.5	FLAT FACE
	20	PL-037-04	1½	GASKET - FOR ABOVE FLANGE	ASBESTOS		COMMERCIAL 1/16 TK.
	21	PL-037-03	2½	GASKET - FOR ABOVE FLANGE	ASBESTOS		COMMERCIAL 1/16 TK.
	22	PL-064-12	½-13X2¼	BOLT HEX HEAD	FORGED STEEL	ASTM-A-307 ANSI B18.2.1	ZINC PLATED
	23	PL-064-5	⅝-11X2¾	BOLT HEX HEAD			
	24	PL-064-6	½-13	NUT HEX		18.2.2	
	25	PL-064-7	⅝-11	NUT HEX		↓	
	26	PL-064-8	½"	WASHER - SPRING LOCK		ASTM-A-307 ANSI-B-27.1	
	27	PL-064-9	⅝"	WASHER - SPRING LOCK	↓	↓	↓
	28	PL-250-1	1½	ELBOW 90° SHORT RADIUS BUTTWELD	WROUGHT STEEL BLACK SCH. 80	ASTM-A-234 ANSI B16.28	BUTTWELD
	29	PL-256-05	1½	ELBOW 45°	WROUGHT STEEL BLACK SCH. 80	ASTM-A-234 ANSI B16.9	BUTTWELD
	30	PL-256-08	3"	ELBOW 45° ↓	WROUGHT STEEL BLACK SCH. 80	ASTM-A-234 ANSI B16.9	BUTTWELD
	31	PL-266-24	3X2½	REDUCER CONCENTRIC	WROUGHT STEEL BLACK SCH. 80	ASTM-A-234 ANSI B16.9	BUTTWELD
	32	PL-036-1		SPANNER CLIP	#11 GA. STEEL		BY HOPEMAN BRO. WAYNE MFG.
	33	PL-036-2		HOSE LOCKING BAR	#7 GA. STEEL		
	34	PL-036-3		HOSE RACK	#11 GA. STEEL		
	35	PL-036-4		APPLICATOR CLIP	↓		
	36	PL-036-5		HOSE RACK	#7 GA. STEEL		
	37	PL-036-6		HOSE LOCKING BAR			
	38	PL-036-7		HOSE LOCKING BAR			
	39	PL-036-8		HOSE RACK	↓		↓
	40	PL-262-3	3X3X1½	TEE REDUCING	WROUGHT STEEL BLACK SCH. 80	ASTM-A-234 ANSI-B-16.9	
	41	PL-266-44	6X5"	REDUCER CONCENTRIC BUTT WELD			
	42	PL-262-23	5"	TEE STRAIGHT	↓	↓	
	43	PL-051-3	5"	FLANGE SLIP-ON 150#	FORGED STEEL	ASTM-A-105 ANSI B16.5	FLAT FACE
	44	PL-051-4	6"	FLANGE SLIP-ON 150#	FORGED STEEL	ASTM-A-105 ANSI B16.5	FLAT FACE
	45	PL-064-10	¾-10	NUT HEX		ASTM-A-307 ANSI B18.2.1	ZINC PLATED
	46	PL-064-22	¾-10X5½	BOLT HEX HEAD	↓	↓ 18.2.2	↓
	47	PL-262-29	6"	TEE STRAIGHT BUTTWELD	WROUGHT STEEL BLACK SCH. 80	ASTM-A-234 ANSI B16.9	
	48	PL-266-41	6"X3"	REDUCER CONCENTRIC			
	49	PL-262-28	6X6"X5"	TEE REDUCING ↓	↓	↓	

PENETRATION LEGEND

SYMBOL	DESCRIPTION
Ⓦ	WATER-TIGHT PENETRATIONS
Ⓐ	'A' CLASS PENETRATIONS
Ⓑ	'B' CLASS PENETRATIONS
Ⓒ	'C' CLASS PENETRATIONS

FOAM ROOM
34" SPACING
47
53
30" SPACING
48
113
46
116
24" SPACING
48
119

REVISIONS

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHO	OWNER DATE	OWNER APPD
O		INITIAL ISSUE 6-21-76 RWM.	6-30-76	RLH	7-?-76 2-21-77	SHELL ZAPATA
A		1. FOAM ROOM DET. 7-A REVISED. 2. SECTION 7-B REVISED. 3. PENETRATION TYPE ADDED. 4. FIRE STATION #31 LOC. REV. MOVED 3' INBOARD. 5. EXTERIOR FIRESTATIONS #28 & 33 LOCATION REVISED; MOVED FWD. TO FR. #7. 6. PIPING UNDER CAMBER DK. REV. TO AGREE W/ REV. #5. 7. REF. NO. 7 ADDED. 8. RESERVATION NO. 1 DELETED. 9. OWNER & N.N. APPRV. ADDED.				
B	2-17-77 R.W.M.	1. FOAM ROOM ARRGT. REV. TO SUIT ENG. DEVELOPMENT. 2. REF. #6 DELETED. 3. DET. 10-B ITEM #34 REV. 4. VALVE POSITION IN ALL INTERIOR FIRE STATIONS REV. FROM 4'-9" TO 18" FR. DK. FOR ACCESSIBILITY. 5. FIRE STATION REV. TO ELIMINATE EXPOSED RISER. 6. FIRE STATIONS REV. TO PREVENT POSSIBLE SNAGGING OF FIRE HOSE. 7. FIRE EXTINGUISHERS ADDED TO ALL INTERIOR F.S. EXCEPT 29 & 30. 8. PARTS LIST REV. TO AGREE W/ ALL ABOVE REVISIONS. 9. "X" DIMS. ADDED. 10. ALL ABOVE REV. ARE PER ENG. DESIGN & DEVELOPMENT 11. ADDED GENERAL NOTES 9 & 10. 12. FOAM ROOM, REV. LOC. OF 5" RISER FROM ENG. ROOM & ADDED BUTTERFLY VALVE TO 4" RISER. 3-8-77 RWM.				
C		1. FOAM ROOM DETAIL REVISED & PIPING UNDER CAMBER DK. REV. PER DESIGN & DEVELOPMENT REVISIONS. 3-22-77 RWM. 2. "X" DIMENSIONS UNDER CAMBER DECK REVISED TO AGREE WITH N.N. COMPOSITE. 6-1-77 RWM. 3. SECTION 7-B X=20" & X=21" WAS X=24" AND NOTE ADDED TO ZONE 6-A. 6-7-77 RWM.	6-29-77	RLH		
D		1. REV LOC OF 5" FM IN FOAM RM TO 6-3 INBD 39' BHD. 2. REV PL# ITEM 18, 19. 3. ADDED NOTE F.S. 28, 33 (INSTALLED BY N.N.) 4. REV PL# ITEM 18, 19, 20, 21 5. REV 'X' DIM 33'-0" OFF ℄ TO X=41" & ADDED 'X' DIM TO 'Y' DIM. 6. 55'-9¾" STBD. ℄ FR. H16 PIPING REV. SECTION 4-B & ELEV. REV. TO AGREE. 7. DELETED 4-5½ DIM 39' OFF ℄ P.S. REF DET 7-A & REV DET 7-A TO AGREE W/ PLAN VIEW. 8. SECTION 10-D REV. 9. CAMBER DK. 14'-7" STBD. ℄ FR. H7 PIPING REV. 10. 'D' DK. 14'-7" STBD. ℄ FR. H8 PIPING REV. 11. CAMBER DK. 56'-9" PORT ℄ FR. H11 & H12; 2½ F.M. UP WAS 8" AFT. FR. H11. 12. 'A' DK. REV. TO AGREE W/ REV. 11. 11-25-77 RM. 13. ITEM NO. 46 PL-064-15 WAS PL-064-11 11-25-77 RM. 14. ITEM NO. 22 PL-064-12 WAS PL-064-06 12-1-77 RM. 15. 47'-0¼" STBD. ℄ FR. H7 2½ F.M. 6' AFT. H9 WAS 6' FWD. H9. 12-5-77 RWM. 16. ITEM NO. 46 PL-064-22 WAS PL-064-15 12-12-77 RM. 17. DET. 6-D REV. LEGS & BACKPLATE DELETED FROM N.N. FURNISHED EXTERIOR FIRE STATION. 1-25-78 RWM.	4-3-78	RC	LTR 3072V	9/2/?

AUTHORITY:

GENERAL NOTES:

1. ALL WELDING TO BE ACCOMPLISHED BY QUALIFIED WELDERS AND BE IN ACCORDANCE WITH THE LATEST RULES OF A.B.S., U.S.C.G. AND REFERENCE 5.
2. ALL PIPING, PIPING APPURTENCES AND APPLICABLE EQUIPMENT SHALL BE THOROUGHLY CLEANED AFTER FABRICATION AND PRIOR TO SHIPBOARD INSTALLATION. AFTER SHIPBOARD INST. THE SYSTEM SHALL BE THOROUGHLY CLEANED AND FLUSHED OF ALL FOREIGN MATTER WITH SALT WATER.
3. ALL PIPING TO BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH TEMPERATURE AND PRESSURE CHART; SEE REF. 2.
4. PENETRATIONS THROUGH WATERTIGHT DECKS AND BULKHEADS SHALL GENERALLY BE ACCOMPLISHED WITH WELDED SLEEVES, FERROUS PIPING WITH A WALL THICKNESS OF .200 INCH OR GREATER MAY BE WELDED DIRECTLY TO STRUCTURE.
5. ALL PIPES, VALVES, FITTINGS, HOSES NOZZLES AND APPLICATORS TO BE IN ACCORDANCE WITH U.S.C.G. AND A.B.S. RULES.
6. FOR MATERIAL SCHEDULE SEE REF. 2.
7. FOR INSULATION REQUIREMENTS SEE REF. 5.
8. FOR ADDITIONAL GENERAL NOTES SEE REF. 2.
9. AT EACH FIRE HOSE VALVE THERE SHALL BE MARKED IN NOT LESS THAN 2" RED LETTERS & FIGURES FIRE STATION 1, 2 ETC.
10. ALL HOSES SHALL BE FITTED WITH APPROVED COMBINATION NOZZLES IN ACCORDANCE WITH 46 CFR 34.10-10 N.

NO.	REFERENCES	DWG NO.
7.	FOAM ROOM ARRANGEMENT AND DETAILS, CAMBER DK.	2400-986
5.	TYP PIPING INSULATIONS HANGER WELDING AND BRAZING DETAILS. (FOR DECKHOUSE ONLY)	2502-140
4.	DETAILS OF INTERIOR FIRE STATIONS CAMBER DECK AND ABOVE.	2400-1051
3.	2½ HOSE RACKS FOR OUTSIDE STATION-MERCHANT STANDARD.	2400-1041
2.	DIAG. FIREMAIN SYSTEM LIST.	2400-960
1.	DIAG. FIREMAIN SYSTEM ARRGT.	2400-959

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615	311	
614	310	
613	309	

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS
OWNERS SHELL LTR. 245V 12-9-76 (613, 614)
ZAPATA APVL. LTR. 2-21-77 (615)
NEWPORT NEWS LTR. 6130/C2400 8-30-76 REV. 0
ABS APVL. LTR. 6-2-77
USCG APVL. LTR. 3-24-77

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689
PIPING DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

SCALE AS NOTED = 1 FT
DRAWN Ron Miller
CHECKED A. H. Salmann
SECT MGR J. T. Caputo
DATE COMPL. 6-1-76
EXAMINED –
AUTHORIZED A. Conley
DATE 6-30-77
TECH APPROVAL
CSD APPROVAL R.L. Harrington

FIREMAIN ARRANGEMENT & DETAILS
"CAMBER DECK AND ABOVE"

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO. 613, 614, 615
DWG NO. 2400-1050
REV D
SHEET NO. 1 OF 1

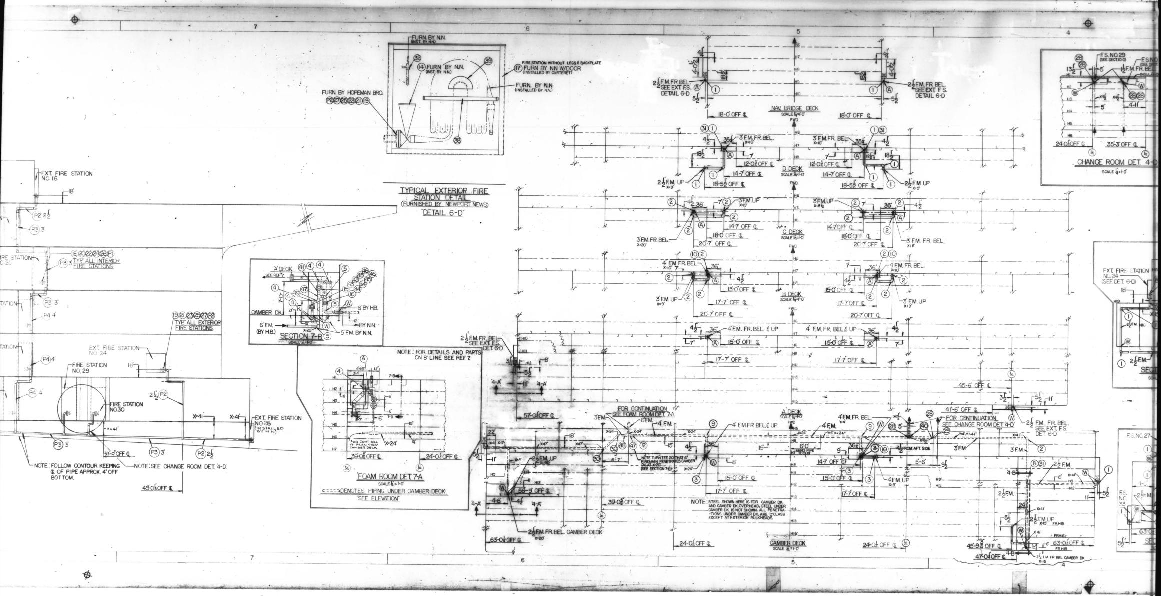
REPRODUCTION OFFICE
YARD PRINTS
REMARKS
DATE
ORDERED BY DESIGN
YARD PRINTS
GROUP:
MC NO.

FIREMAINS
2400-1050

2400 ·1050

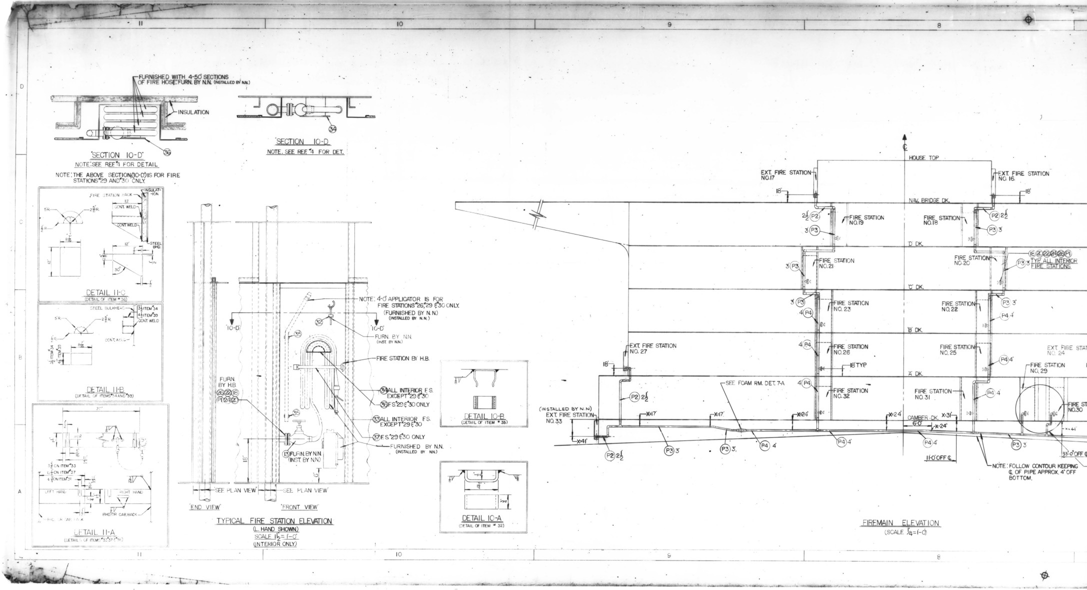
MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80
FRAME 1
10X


TYPICAL EXTERIOR FIRE STATION DETAIL
(FURNISHED BY NEWPORT NEWS)
"DETAIL 6-D"
FURN. BY N.N. (INST. BY N.N.)
FURN. BY N.N. (INST. BY N.N.)
FIRE STATION WITHOUT LEGS & BACKPLATE
FURN. BY N.N. W/DOOR (INSTALLED BY CARTERET)
FURN. BY N.N. (INSTALLED BY N.N.)
FURN. BY HOPEMAN BRO.
EXT. FIRE STATION NO. 16
TYP. ALL INTERIOR FIRE STATIONS
TYP. ALL EXTERIOR FIRE STATIONS
EXT. FIRE STATION NO. 24
FIRE STATION NO. 29
FIRE STATION NO. 30
EXT. FIRE STATION NO. 28 (INSTALLED BY N.N.)
NOTE: FOLLOW CONTOUR KEEPING ℄ OF PIPE APPROX. 4" OFF BOTTOM.
NOTE: SEE CHANGE ROOM DET. 4-D
SECTION 7-B
6" F.M. (BY H.B.)
5" F.M. BY N.N.
CAMBER DK.
'A' DECK
NOTE: FOR DETAILS AND PARTS ON 8' LINE SEE REF. 7
FOAM ROOM DET. 7-A
SCALE ¼"=1'-0"
DENOTES PIPING UNDER CAMBER DECK "SEE ELEVATION"
NAV. BRIDGE DECK
D DECK
C DECK
B DECK
A DECK
CAMBER DECK
FWD.
SEE EXT. F.S. DETAIL 6-D
FOR CONTINUATION SEE FOAM ROOM DET. 7-A
FOR CONTINUATION SEE CHANGE ROOM DET. 4-D
NOTE TURN TEE SO THAT 6" FIREMAIN PENETRATES CAMBER DK. AT X-20 (SEE SECTION 7-B)
NOTE: STEEL SHOWN HERE IS FOR CAMBER DK. AND CAMBER DK. OVERHEAD; STEEL UNDER CAMBER DK. IS NOT SHOWN. ALL PENETRATIONS UNDER CAMBER DK. ARE "C" CLASS EXCEPT AT EXTERIOR BULKHEADS.
2½" F.M. FR. BEL. CAMBER DECK
CHANGE ROOM DET. 4-D
F.S. NO. 29
EXT. FIRE STATION NO. 24 (SEE DET. 6-D)
F.S. NO. 27
7
6
5
4

2400 ·1050

SEPT. '80
FRAME 2
10X


FURNISHED WITH 4-50' SECTIONS OF FIRE HOSE. FURN. BY N.N. (INSTALLED BY N.N.)
INSULATION
SECTION 10-D
NOTE: SEE REF. 4 FOR DETAIL
NOTE: THE ABOVE SECTION (10-D) IS FOR FIRE STATIONS 29 AND 30 ONLY.
SECTION 10-D
NOTE. SEE REF. 4 FOR DET.
FIRE STATION RACK
INSULATION
CONT. WELD
STEEL BHD.
DETAIL 11-C
(DETAIL OF ITEM 36)
STEEL BULKHEAD
ITEM 34
ITEM 39
CONT. WELD
DETAIL 11-B
(DETAIL OF ITEMS 34 AND 39)
ON ITEM 33
ON ITEM 37
ON ITEM 36
LEFT HAND
RIGHT HAND
BHD. OR CAB. RACK
DETAIL 11-A
(DETAILS OF ITEMS 33, 37 & 36)
NOTE: 4'-0 APPLICATOR IS FOR FIRE STATIONS 26, 29 & 30 ONLY. (FURNISHED BY N.N.) (INSTALLED BY N.N.)
10-D
FURN. BY N.N. (INST. BY N.N.)
FIRE STATION BY H.B.
FURN. BY H.B.
34 ALL INTERIOR F.S. EXCEPT 29 & 30
36 F.S. 29 & 30 ONLY
33 ALL INTERIOR F.S. EXCEPT 29 & 30
37 F.S. 29 & 30 ONLY
FURNISHED BY N.N. (INSTALLED BY N.N.)
13 FURN. BY N.N. (INST. BY N.N.)
SEE PLAN VIEW
END VIEW
FRONT VIEW
TYPICAL FIRE STATION ELEVATION
(L. HAND SHOWN)
SCALE 1½" = 1'-0"
(INTERIOR ONLY)
DETAIL 10-B
(DETAIL OF ITEM 35)
DETAIL 10-A
(DETAIL OF ITEM 32)
HOUSE TOP
EXT. FIRE STATION NO. 17
EXT. FIRE STATION NO. 16
NAV. BRIDGE DK.
FIRE STATION NO. 19
FIRE STATION NO. 18
'D' DK.
FIRE STATION NO. 21
FIRE STATION NO. 20
TYP. ALL INTERIOR FIRE STATIONS
'C' DK.
FIRE STATION NO. 23
FIRE STATION NO. 22
'B' DK.
EXT. FIRE STATION NO. 27
FIRE STATION NO. 26
FIRE STATION NO. 25
EXT. FIRE STATION NO. 24
FIRE STATION NO. 29
18" TYP
'A' DK.
SEE FOAM RM. DET. 7-A
FIRE STATION NO. 32
FIRE STATION NO. 31
FIRE STATION NO. 30
(INSTALLED BY N.N.) EXT. FIRE STATION NO. 33
CAMBER DK.
11'-0" OFF ℄
33'-0" OFF ℄
NOTE: FOLLOW CONTOUR KEEPING ℄ OF PIPE APPROX. 4" OFF BOTTOM.
FIREMAIN ELEVATION
(SCALE ¼" = 1'-0")
11
10
9
8
D
C
B
A

2400 ·1050

SEPT. '80
FRAME 3
10X

REPRODUCTION OFFICE

YARD PRINTS ______ GROUPING ______

REMARKS ______

DATE ______ SIGNED ______

	FIRST ISSUE	DEPT.	NO. PRTS.	REV.	DATE ISSUED	SPECIAL PRINTS
YARD PRINTS		AH				
		BL				
		BR				
		EL				
		FP				
		MI				
		ML				
		MS				
		PC				
		PM				
		PS				
		PN				
		RD				
		RM				
		MIR				
		SH				
		SM				
		TM				
		WD				
		WE				
		WM				
		CSD				
ORDERED BY DESIGN						

GROUP: MC NO. ______

K&E 10 1283 8-73 2248+

AUTHORITY

DWG. REV. — HULL APPLIC.						
REV.	NN HULLS ONLY					

ISSUE	
PARTIAL	
COMPLETE	✓

SHEET	1	2	3	4	5	6	7	8	9	10
REVISION	A	A	O	O	O	O	O	A	O	O
SHEET										
REVISION										
SHEET										
REVISION										

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS SHELL APVL. LTR. 1429V 2-9-77	ABS APVL. 2-14-77
U.S.P.H. APVL. LTR. 12-20-76	USCG APVL. LTR. 3675 1-31-77
N.N. APVL. LTR. 3-4-77	

Newport News Shipbuilding
A Tenneco Company
TENNECO

Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.

FSCM NO. 43689
PIPING DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

SCALE AS NOTED = 1 FT
DRAWN R.W.M.
CHECKED R.H. Salmon
SECT MGR J. F. Caputo
DATE COMPL. 12-1-76
EXAMINED —
AUTHORIZED A. CONLEY
DATE 5-26-77
TECH APPROVAL
CSD APPROVAL R.L. HARRINGTON

DECKHOUSE PIPING
TYPICAL PIPING INSTALLATION DETAILS AND GENERAL NOTES

U S M A DESIGN T11-S-116A
U S M A DWG NO. ______ HULL NO. ______

DWG NO. 2502-140
REV B
SHEET NO. 1 OF 10

MN15-17X22 (REV. 1)
MODIFIED

2502-140

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

6X

TABLE OF CONTENTS

SH NO.	TITLE
1.	TITLE SHEET
2.	INDEX AND REVISIONS
3.	DESIGN SPECIFICATIONS
4.	GENERAL NOTES
5.	GENERAL NOTES CON'T.
6.	HANGER DETAILS
7.	INSULATION
8.	SLEEVE AND PENETRATION CUT SIZES
9.	PENETRATION DETAILS
10.	WELDING DETAILS

NO.	REFERENCES		DWG. NO.

REVISIONS

COST CHG NO.		REV	SH NO.	DESCRIPTION	NNS&DD CO		USN	
NN	NAVSHIPS				DATE	AUTHD	DATE	APPD
		O		SUBMITTED FOR APPROVAL	3-4-77	R.L.H.	2-9-77	SHELL
		A	8	1. INITIAL ISSUE 2 SLEEVE PL NOS REVISED AND SLEEVE MATERIAL ORDER NOS ADDED 3-31-77 R.W.M.				

HULL NO. 613-615C	DWG. NO. 2502-140
REV.	B
SHEET	2

NN14-17 X 22 (REV. 1)

2502-140

SEPT. '80

6X

DESIGN SPECIFICATIONS

SERVICE	DESIGN PRESSURE	MAX. PRESS FOR CLASS II PIPING(P.S.I.G.)	TEST PRESSURE P.S.I.G.	DESIGN TEMPERATURE (F°)	MAX. TEMPERATURE FOR CLASS II PIPING
SANITARY DR. (LAVATORIES LAUNDRY INT. & SHOWER DK.DR. SERV. SK. ETC.)	CLASS II	- - -	HYDROSTATIC TEST	CLASS II	- - -
SOIL DRAINS (WATER CLOSETS)	CLASS II	- - -	HYDROSTATIC TEST	CLASS II	- - -
HOT WATER	CLASS II (127)	225	127	CLASS II (140)	350
COLD WATER	CLASS II (127)	225	127	CLASS II (100)	350
STEAM	CLASS II (50)	150	75	CLASS II (350)	650
REFRIGERATION	CLASS II RESERVED	150	PRELIMINARY TEST PRESSURE 20 P.S.I.G.	CLASS II	650
FIREMAIN	CLASS II (205)	225	310	CLASS II	350
EXTERIOR DK. DRAINS	CLASS II	- - -	HYDROSTATIC TEST	CLASS II	- - -
FOAM RM. ARRANGEMENT	CLASS II (205)	225	308	CLASS II	350

HULL NO. 613-615C	DWG. NO. 2502-140	REV. B
		SHEET 3

2502 - 140

SEPT. '80

6X

GENERAL NOTES

1. ALL PIPING, TUBING, VALVES, FITTINGS, INSULATION AND OTHER MATERIALS MUST MEET THE REQUIREMENTS OF U.S.C.G. A.B.S. AND U.S.P.H.
2. ALL WELDING AND BRAZING TO BE ACCOMPLISHED BY WELDERS AND BRAZERS QUALIFIED IN ACCORDANCE WITH THE RULES OF A.B.S.
3. ALL PIPE SIZES ARE I.P.S. AND TUBING SIZES ARE NOMINAL O.D. TUBING.
4. PIPING AND TUBING TO BE NORMALLY BENT TO A RADIUS OF FIVE (5) TIMES THE NOMINAL DIAMETER, FOUR (4) TIMES IS THE MINIMUM BEND ACCEPTABLE.
5. ALL PIPING IN LIVING SPACES SHALL BE CONCEALED WHERE PRACTICAL.
6. SWING CHECK VALVES ARE TO BE INSTALLED IN A FORE AND AFT. POSITION.
7. DRAIN PIPES CARRING SEWAGE OR OTHER LIQUID WASTE PASSING THROUGH SPACES WHERE FOOD IS STORED, PREPARED OR SERVED ARE TO BE EXTRA HEAVY MATERIAL. SANIT AND SOIL DRAINS SHALL BE HYDROSTATICALLY TESTED TESTED TO 50 P.S.I. FOR LEAKS.
8. TO THE MAXIMUM PRACTICAL EXTENT WATER PIPING SHALL NOT BE RUN THROUGH THE CARGO CONTROL ROOM, GYRO ROOM, BATTERY ROOM, CHART ROOM, RADIO ROOM, EQUIPMENT CONTROL ROOM, AND OTHER SIMILAR SPACES, WHERE THIS IS NOT PRACTICAL THE PIPING WITHIN THESE SPACES SHALL BE FITTED IN ONE LENGTH OR CONT. WELDED OR BRAZED USING EXTRA HEAVY PIPE OR TUBE.
9. NO PIPING SHALL BE LEAD THROUGH REFRIGERATED SPACES EXCEPT THOSE SERVING THAT SPACE.
10. PIPING SUBJECT TO MECHANICAL INJURY SHALL BE PROTECTED AS SHOWN ON ARRGT. DWGS.
11. ALL VALVES ARE TO BE PROVIDED WITH A LABEL PLATE CLEARLY STATING THEIR PURPOSE.
12. AFTER INSTALLATION OF ALL PIPING THE SYSTEMS SHALL BE CLEANED BY FLUSHING WITH FRESH WATER.
13. CLEANOUTS OR DRAINPLUGS SHALL BE PROVIDED AS SHOWN ON ARRGT. DWGS.
14. INTERIOR DECK DRAINS AT ENTRANCE TO AREAS FROM THE WEATHER SHALL HAVE WATER SEAL TRAPS.
15. ALL EQUIPMENT PROVIDED WITH DRAINS ARE TO BE TRAPPED AT THE FIXTURE, TRAPS ARE TO BE ARRANGED TO PERMIT MAINTENANCE WITHOUT REMOVAL OF HEAVY, BUILT-IN ITEMS.
16. POTABLE WATER SYSTEM SHALL BE INSTALLED SO AS TO PREVENT BACK SIPHONAGE FROM FIXTURE AND EQUIPMENT.
17. WHERE ASTM B61 OR B62 IS USED A MILL CERTIFICATION IS MANDATORY AND SHALL BE MADE AVAILABLE FROM THE MILL, UPON REQUEST INDICATING THAT CASTINGS MEET THE CHEMICAL AND TENSION REQUIREMENTS IN TABLE 1 AND 2 OF THE ABOVE MENTIONED A.S.T.M. SPEC.

CONT.

HULL NO. 613-615C	DWG NO. 2502-140	REV. B
		SHEET 4

MN15-17X22 (REV. 1)

2502-140

MICRO-MASTER 105 mm
K+E

SEPT. '80
6X

GENERAL NOTES CONT.

PIPE HANGER

18. ALL WELDING TO BE IN ACCORDANCE WITH A.B.S. RULES.

19. HANGERS ARE NOT TO BE LOCATED ON WELDED PIPE JOINTS.

20. HANGERS SUPPORTING HORIZONTAL STEEL PIPE OR COPPER TUBE TO BE SPACED AS FOLLOWS.

3/4" AND BELOW——5'-0" MAX.
1" AND 1½"——6'-0" MAX.
2" THRU 3½"——10'-1½" MAX.
4" THRU 5"——13'-6" MAX.
6" & ABOVE——16'-10½" MAX.

21. VERTICAL PIPE HANGERS MAY BE SPACED TWICE AS FAR APART AS SHOWN IN NOTE 3 ABOVE.

22. WHERE COPPER TUBING OR COPPER ALLOY IS USED STEEL HANGERS ARE TO BE NEOPRENE COATED AND USED WITH RUBBER INSERTS.

23. ALL METAL PARTS OF HANGERS TO BE THROUGHLY CLEANED AND PAINTED BEFORE INSTALLATION, WITH EITHER BAKED PRIME ENAMEL OR ZINC COATED.

24. MULTIPLE RUNS OF SMALL PIPES OR TUBES MAY BE SUPPORTED WITH UNISTRUT NELSON STUD OR HYDRO-ZORB CHANNEL AND CLAMPS OR OTHER SIMILAR SYSTEMS.

25. SEE SHT. 6 FOR HANGER DETAILS.

FINISHING

26. INTERNAL SURFACE PREPERATION AND COATING OF STEEL PIPE.
   A. MECHANICAL CLEAN, WHERE PRACTICAL, AND WASHOUT AFTER FABRICATION WHERE REQUIRED.

27. EXTERNAL SURFACE PREPERATION AND COATING OF UNINSULATED STEEL PIPE.
   A. SANDBLAST.
   B. APPLY ON COAT DEVRAN 308 AT 2 MILS. DFT.
   C. TOUCH UP DAMAGED AREAS WITH DEVRAN 308.
   D. APPLY ONE COAT DEVRAN 4473 AT 1½ MILS. DFT.
   E. EXPOSED PIPE TO RECEIVE COSMTIC COAT TO MATCH SURROUNDING STRUCTURE.

28. EXTERNAL SURFACE PREPERATION AND COATING OF INSULATED STEEL PIPE.
   A. SANDBLAST.
   B. APPLY ONE COAT DEVRAN 308 AT 2 MILS. DFT.

29. NON-FERROUS PIPING AND COMPONENTS NEED NOT BE PAINTED.

HULL NO. 613-615C	**DWG NO.** 2502-140	**REV.** B
		SHEET 5

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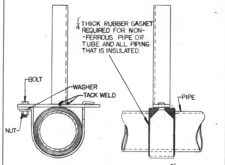
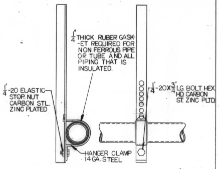
TYPICAL HANGER DETAILS

TYPE H-1


1/4" THICK RUBBER GASKET REQUIRED FOR NON-FERROUS PIPE OR TUBE AND ALL PIPING THAT IS INSULATED.
BOLT
WASHER
TACK WELD
PIPE
NUT

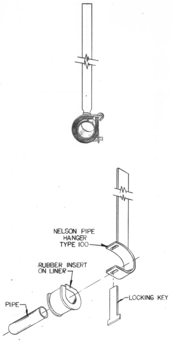
NOTE: HANGER BRACKET MATERIAL TO BE 2"X1"X$\frac{3}{16}$" TK. ANGLE IRON.

TYPE H-3


1/4" THICK RUBER GASKET REQUIRED FOR NON FERROUS PIPE OR TUBE AND ALL PIPING THAT IS INSULATED.
1/4"-20 ELASTIC STOP NUT CARBON STL. ZINC PLATED
1/4"-20X3/4" LG. BOLT HEX. HD. CARBON ST. ZINC PLTD.
HANGER CLAMP 14 GA. STEEL

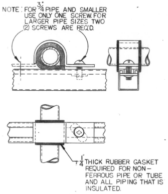
NOTE: HANGER BRACKET MATERIAL TO BE 2"X1"X$\frac{3}{16}$" TK. ANGLE IRON.

TYPE H-5

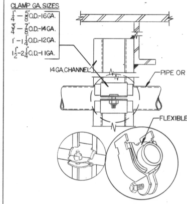

NELSON PIPE HANGER TYPE 100
RUBBER INSERT ON LINER
PIPE
LOCKING KEY

NOT USED ON U.L.C.C.

TYPE H-2


NOTE: FOR 3/4" PIPE AND SMALLER USE ONLY ONE SCREW. FOR LARGER PIPE SIZES TWO (2) SCREWS ARE REQ'D.
1/4" THICK RUBBER GASKET REQUIRED FOR NON-FERROUS PIPE OR TUBE AND ALL PIPING THAT IS INSULATED.

TYPE H-4


CLAMP GA. SIZES
1/4" - 5/8" O.D. - 16GA.
3/4" - 7/8" O.D. - 14GA.
1" - 1 1/4" O.D. - 12GA.
1 1/2" - 2 1/4" O.D. - 11GA.
14 GA. CHANNEL
PIPE OR TUBE
FLEXIBLE CUSHION

NOT USED ON U.L.C.C.

HULL NO. 613-615C	DWG. NO. 2502-140	REV. B
		SHEET 6

2502-140

MICRO-MASTER 105 mm

K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

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INSULATION TYPES

TYPE I-CELLULAR FOAM PLASTIC

A. CELLULAR FOAM PLASTIC TUBULAR INSULATION IS SLIPPED OVER THE OPEN END OF STRAIGHT OR CURVED TUBING OR PIPE. BUTTED ENDS ARE BRUSH COATED WITH ARMSTRONG NO. 520 ADHESIVE AND PRESSED FIRMLY TOGETHER. ON INSTALLED PIPE, SPLIT TUBULAR INSULATION AND SNAP OVER PIPE. BRUSH COAT SEAMS WITH NO. 520 AND PRESS FIRMLY TOGETHER, FITTINGS TO BE MITER CUT AND FITTED TOGETHER AS ABOVE.

TYPE II-CALCIUM SILICATE

A. APPLY CALCIUM SILICATE IN ONE LAYER WITH ALL JOINTS AND SEAMS TIGHTLY BUTTED TOGETHER WITH FOSTER 3131 164.012/11/0 . SECURE INSULATION TO PIPE WITH #18 B.W.G. BLACK ANNEALED WIRE ON 6" CENTERS. THE END OF THE WIRE IS TO BE BENT OVER, TWISTED AND HAMMERED INTO INSULATION. LAGGING MATERIAL SHALL BE GLASS CLOTH WITH FOSTER 3131 164.012/11/0 COATING AT 1/16" THICK FOR A SMOOTH FINISH.

TYPE III-FOIL FACED FIBER GLASS

A. (1") THICK .75 POUND DENSITY FLEXIBLE FIBERGLASS FACED ON ONE SIDE W/.002 THICK DEAD SOFT ALUMINUM. JOINTS AND SEAMS ARE SECURED WITH ALUMINUM FOIL DUCT TAPE.

INSULATION LIST

DWG. NOS.	SYSTEMS	INSULATION TYPE
2670-108	A.C. REFRIGERATION PIPING	
	1. BEHIND LINING AND CONCEALED SPACES ONLY.	NO. 1—TYPE I AND III
	2. INSIDE FAN ROOM.	NO. 2—TYPE I
	3. UNDER CAMBER DECK.	NO. 3—TYPE I
2652-260	SERVICE STEAM SYSTEM	
	1. BEHIND LINING AND CONCEALED SPACES ONLY.	NO. 1 - TYPE III
	2. INSIDE FAN ROOM.	NO. 2 - TYPE II
	3. UNDER CAMBER DECK.	NO. 3 - TYPE II
2350-1344 1347 1348 1349 1350 1352	HOT POTABLE WATER SYS. & DRINKING FOUNTAIN DRAINS	
	1. HOT POTABLE WATER, BEHIND LINING AND CONCEALED SPACES.	NO. 1 - TYPE III
	2. DRINKING FOUNTAIN DRS. 5FT. OR TO FIRST BRANCH CONN.	NO. 2 - TYPE III
	3. HOT POTABLE WATER UNDER CAMBER DK.	NO. 3 - TYPE I OR II
2400-1050	FIREMAIN	
	1. BEHIND LINING AND CONCEALED SPACES ONLY.	NO. 1 - TYPE III
	2. UNDER CAMBER DECK AND FOAM ROOM AREA.	NO. 2 - TYPE I OR II

HULL NO. 613-615C	DWG NO 2502-140	REV. B
		SHEET 7

MN15-17X22 (REV. 1)

2502 - 140

MICRO-MASTER® 105 mm
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ALEXANDRIA • RICHMOND • NORFOLK
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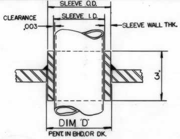
SLEEVE INFORMATION FOR PIPE AND TUBING PENETRATIONS

PIPE SLEEVE CHART FOR COPPER TUBING

TUBING INFORMATION			STEEL TUBING – SLEEVE MATERIAL			SLEEVE INFORMATION						
NOM. SIZE	OUTSIDE DIA.	TYPE OF MAT'L.	MAT'L. SPECIFICATIONS	STEEL TUBE INSIDE DIA.	WALL THK.	BORE OUT	SLEEVE INSIDE DIA.	WALL THICKNESS	SLEEVE LENGTH	DECK PENT. DIM.'D'	SLEEVE PL. NO.	SLEEVE MAT'L. ORDER NO.
1/4"	0.375	COPPER TUBE	7/8 O.D. STEEL TUBE GRADE 1015	.375	.250	.006	.381	.247	3"	1.000	PL-149-51	PL-149-01
3/8"	0.500	TYPE 'K' OR 'L'	1"	.500			.506			1.125	53	03
1/2"	0.625		1 1/8"	.625			.631			1.250	55	05
5/8"	0.750		1 1/4"	.750			.756			1.375	57	07
3/4"	0.875		1 3/8"	.875			.881			1.500	58	08
1"	1.125		1 5/8"	1.125			1.131			1.750	61	11
1 1/4"	1.375		1 7/8"	1.375			1.381			2.000	63	13
1 1/2"	1.625		2 1/8"	1.625			1.631			2.250	64	14
2"	2.125		2 5/8"	2.125			2.131			2.750	67	17
2 1/2"	2.625		3 1/8"	2.625			2.631			3.250	69	19
3"	3.125		3 5/8"	3.125			3.131			3.750	71	21
4"	4.125		4 5/8"	4.125	↓		4.131	↓		4.750	72	22
5"	5.125	↓	5 3/4" ↓ ↓ ↓	5.125	.313	↓	5.131	.310	↓	5.875	↓ 73	↓ 23

PIPE SLEEVE CHART FOR COPPER-NI. PIPE RED BRASS PIPE AND (STEEL PIPE W/WALL THICKNESS LESS THAN 0.200)

PIPE INFORMATION			STEEL TUBING – SLEEVE MATERIAL			SLEEVE INFORMATION						
NOM. SIZE	OUTSIDE DIA.	TYPE OF MAT'L.	MAT'L. SPECIFICATIONS	STEEL TUBE INSIDE DIA.	WALL THK.	BORE OUT	SLEEVE INSIDE DIA.	WALL THICKNESS	SLEEVE LENGTH	DECK PENT DIM.'D'	SLEEVE PL. NO.	SLEEVE MAT'L. ORDER NO.
1/8"	0.405	COPPER NI PIPE,	7/8 O.D. STEEL TUBE GRADE 1015	.375	.250	.036	.411	.232	3"	1.000	PL-149-52	PL-149-01
1/4"	0.540	RED BRASS PIPE,	1"	.500	.250	.046	.546	.227		1.125	54	03
3/8"	0.675	STEEL PIPE W/0.200	1 1/8"	.625	.250	.056	.681	.222		1.250	56	05
1/2"	0.840	WALL TKS. OR LESS	1 3/8"	.813	.281	.034	.847	.264		1.500	59	09
3/4"	1.050		1 1/2"	1.024	.238	.032	1.056	.222		1.625	60	10
1"	1.315		1 3/4"	1.312	.219	.010	1.322	.214		1.875	62	12
1 1/4"	1.660		2 1/8"	1.625	.250	.042	1.667	.229		2.250	65	14
1 1/2"	1.900		2 3/8"	1.875	.250	.032	1.907	.234		2.500	66	16
2"	2.375		2 7/8"	2.375	.250	.006	2.381	.247		3.000	68	18
2 1/2"	2.875	↓	3 3/8" ↓ ↓ ↓	2.875	.250	.006	2881	.247	↓	3.500	↓ 70	↓ 20



TYP. SLEEVE PENETRATION

HULL NO. 613-615	DWG NO 2502-140	REV. B
		SHEET 8

H24136

MN15-17X22 (REV. 1)

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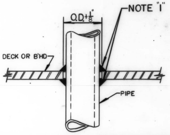
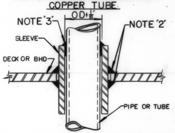
WATERTIGHT PENETRATIONS

TYPE WT-1
FOR STEEL PIPE WITH A WALL THICKNESS LARGER THAN 0.200


O.D.+$\frac{1}{8}$"
NOTE "1"
DECK OR B'HD
PIPE

TYPE WT-2
FOR STEEL PIPE WITH A WALL THICKNESS SMALLER THAN 0.200 AND FOR COPPER NI PIPE OR COPPER TUBE

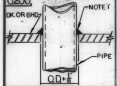

NOTE "3"
O.D.+$\frac{1}{8}$"
NOTE "2"
SLEEVE
DECK OR BHD
PIPE OR TUBE

NOTES

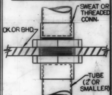
1. PIPE TO BE WELDED TO PLATING WITH A FILLET WELD SIZE EQUAL TO THE THICKNESS OF THE PLATING OR PIPE WHICH--EVER IS THINNER. UNDERSIDE OF PLATING TO RECEIVE SMALL FILLET WELD; TO FILL VOID BETWEEN PIPE & PLATE.
2. SLEEVE TO BE WELDED TO PLATING WITH A FILLET WELD SIZE EQUAL TO THE THICKNESS OF THE PLATING OR SLEEVE WHICHEVER IS THINNER. UNDERSIDE OF PLATING TO RECEIVE SMALL FILLET WELD; TO FILL VOID BETWEEN SLEEVE & PLATE.
3. SLEEVE TO BE WELDED TO STEEL PIPE AND BRAZED TO COPPER-NI. PIPE OR COPPER TUBE.

"A" CLASS PENETRATIONS

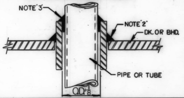
TYPE A-1
FOR STEEL WITH A WALL THICKNESS LARGER THAN 0.200.


DK. OR BHD.
NOTE '1'
PIPE
O.D.+$\frac{1}{8}$"

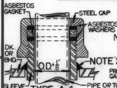
TYPE A-2
FOR COPPER TUBE


SWEAT OR THREADED CONN.
DK. OR BHD.
TUBE (2" OR SMALLER)

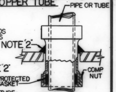
TYPE A-3
FOR STEEL PIPE WITH A WALL THICKNESS SMALLER THAN 0.200 AND FOR COPPER-NI PIPE OR COPPER TUBE.


NOTE "3"
NOTE "2"
DK. OR BHD.
PIPE OR TUBE
O.D.+$\frac{1}{8}$"

TYPE A-4 AND TYPE A-5
FOR STEEL PIPE WITH A WALL THICKNESS SMALLER THAN 0.200 AND FOR COPPER-NI. PIPE OR COPPER TUBE


ASBESTOS GASKET
STEEL CAP
ASBESTOS WASHERS
DK. OR BHD.
O.D.+$\frac{1}{8}$"
NOTE "2"
SLEEVE
PIPE OR TUBE

TYPE A-4


PIPE OR TUBE
NOTE "2"
PROTECTED GASKET
COMP NUT

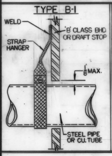
TYPE A-5

NOTES

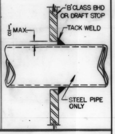
1. PIPE TO BE WELDED TO PLATING WITH A FILLET WELD; SIZE EQUAL TO THE THICKNESS OF THE PLATING OR PIPE WHICHEVER IS THINNER.
2. SLEEVE TO BE WELDED TO PLATING WITH A FILLET WELD; SIZE EQUAL TO THE THICKNESS OF THE PLATING OR PIPE WHICHEVER IS THINNER.
3. SLEEVE OR TOP PLATE IS TO BE WELDED TO STEEL PIPE AND BRAZED TO COPPER-NI PIPE OR COPPER TUBE.

"B" CLASS PENETRATIONS

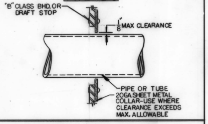
TYPE B-1


WELD
'B' CLASS BHD OR DRAFT STOP
STRAP HANGER
$\frac{1}{8}$" MAX.
STEEL PIPE OR CU. TUBE

TYPE B-2

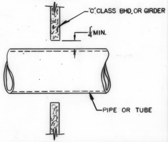

'B' CLASS BHD OR DRAFT STOP
$\frac{1}{8}$" MAX.
TACK WELD
STEEL PIPE ONLY

TYPE B-3


"B" CLASS BHD. OR DRAFT STOP
$\frac{1}{8}$" MAX CLEARANCE
PIPE OR TUBE
20GA. SHEET METAL COLLAR-USE WHERE CLEARANCE EXCEEDS MAX. ALLOWABLE

"C" CLASS PENETRATIONS

TYPE C-1


"C" CLASS BHD. OR GIRDER
$\frac{1}{4}$" MIN.
PIPE OR TUBE

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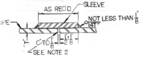
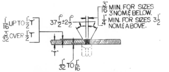
JOINT TYPE WP-1


AS REQ'D.
SLEEVE
PIPE
NOT LESS THAN 1/8"
1.4T
"T"
0" TO 1/8"
1/2" + 1/8"
SEE NOTE 2

NOTES:
1. I.D. OF SLEEVE SHALL NOT EXCEED THE PIPE O.D. BY MORE THAN 0.080.
2. CARE IS TO BE TAKEN THAT ENDS OF PIPES ARE SQUARE AND SMOOTH.

PIPING CLASS		SIZE	MAX. PRESSURE	MAX. TEMP. °F
I	II			
YES	YES	2" AND LESS	UNLIMITED	UNLIMITED
NO	YES	ALL	SEE SHT. 3	SEE SHT. 3

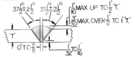
JOINT TYPE WP-2


3/16" MIN. FOR SIZES 3" NOM. & BELOW.
1/4" MIN. FOR SIZES 3 1/2" NOM. & ABOVE.
37 1/2° ± 2 1/2°
1/16" UP TO 1/2" "T"
3/32" OVER 1/2" "T"
"T"
1/32" TO 1/16"

"V" GROOVED BUTT JOINT WELDED ON PERMANENT BACKING RING

PIPING CLASS		SIZE	MAX. PRESSURE	MAX. TEMP. °F
I	II			
YES	YES	1 1/4" & ABOVE	UNLIMITED	UNLIMITED

JOINT TYPE WP-4


37 1/2° ± 2 1/2°
37 1/2° ± 2 1/2°
1/16" MAX. UP TO 1/2" "T."
3/32" MAX. OVER 1/2" TO 1" "T."
"T"
0" TO 1/8"
1/32" TO 1/16"

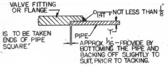
"V" GROOVED BUTT WELD (WELDED ONE SIDE)

NOTES:
1. USE WHERE INSIDE OF JOINT IS NOT REQUIRED TO BE CLEANED AND GROUND FLUSH SUCH AS VENTS OVERFLOWS AND GRAVITY DRAINS.
2. SQUARE GROOVED WELDS WITHOUT EDGE PREPARATION MAYBE EMPLOYED WHERE WALL THICKNESS DOES NOT EXCEED 3/16".
3. WHERE INSIDE OF JOINT IS REQUIRED TO BE CLEANED AND GROUND FLUSH, THIS JOINT TYPE MAY BE USED IF ACCESSIBLE, OTHERWIS USE JOINT TYPE WP-2.

PIPING CLASS		SIZE	MAX. PRESSURE	MAX. TEMP. °F
I	II			
NO	YES	1 1/4" & ABOVE	SEE SHT. 3	SEE SHT. 3

JOINT TYPE WP-5

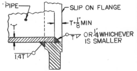
"CARE IS TO BE TAKEN THAT ENDS OF PIPE ARE SQUARE."


VALVE FITTING OR FLANGE
1.4T
NOT LESS THAN 1/8"
"T"
PIPE
APPROX. 1/16" – PROVIDE BY BOTTOMING THE PIPE AND BACKING OFF SLIGHTLY TO SUIT, PRIOR TO TACKING.

SOCKET WELD

PIPING CLASS		SIZE	MAX. PRESSURE	MAX. TEMP. °F
I	II			
YES	YES	2" & BELOW	UNLIMITED	UNLIMITED
NO	YES	ALL	SEE SHT. 3	SEE SHT. 3

JOINT TYPE WP-6

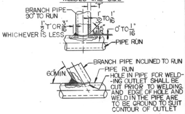

PIPE
SLIP ON FLANGE
"T"
T + 1/8" MIN
T OR 1/4" WHICHEVER IS SMALLER
1.4T

PIPING CLASS		SIZE	MAX. PRESSURE	MAX. TEMP. °F
I	II			
★	YES	ALL	SEE SHT 3	SEE SHT. 3

★ MAY BE USED EXCEPT THAT WHEN SIZE EXCEEDS 2 1/2 NOM. THE SERVICE CONDITIONS MUST NOT EXCEED THE 300 LB. PRESSURE TEMPERATURE RATING.

JOINT TYPE WP-7

WELDED ONE SIDE


"T"
BRANCH PIPE 90° TO RUN
1/32" TO 1/16"
1/2" "T" OR 3/16" WHICHEVER IS LESS
45° MIN.
0" TO 1/16"
PIPE RUN
BRANCH PIPE INCLINED TO RUN
PIPE RUN
60° MIN.
HOLE IN PIPE FOR WELDING OUTLET SHALL BE CUT PRIOR TO WELDING. AND EDGE OF HOLE AND WELD IN THE PIPE ARE TO BE GROUND TO SUIT CONTOUR OF OUTLET

NOTES:
1. USE WHERE THE MAIN IS THE SAME SIZE OR LARGER THAN THE BRANCH.
2. BRANCH SHALL BE SHORT ENOUGH TO PERMIT INSPECTION AND CLEANING IF REQUIRED.

"CONTINUED" ↓

JOINT TYPE WP-7

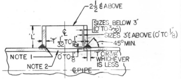
↓

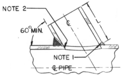
3. USE WHERE INSIDE OF JOINT IS NOT REQUIRED TO BE CLEANED AND GROUND FLUSH, SUCH AS VENTS, OVERFLOWS AND GRAVITY DRAINS.
4. THIS JOINT MUST BE CHECKED FOR REINFORCEMENT REQUIREMENT BEFORE BEING USED.

PIPING CLASS		SIZE	MAX. PRESSURE	MAX. TEMP. °F
I	II			
NO	YES	1 1/2" & ABOVE	SEE SHT. 3	212°

JOINT TYPE WP-8

WELDED BOTH SIDES


2 1/2" & ABOVE
"L"
℄
SIZES BELOW 3" (0" TO 3/32")
SIZES 3" & ABOVE (0" TO 1/8")
"T"
1/32" TO 1/16"
45° MIN.
NOTE 1
0" TO 1/8"
T OR 3/8" WHICHEVER IS LESS
NOTE 2
℄ PIPE


NOTE 2
60° MIN.
℄
L
NOTE 1
℄ PIPE

NOTES
1. INTERNAL WELD TO BE MADE FIRST.
2. HOLE IN PIPE FOR WELDING OUTLET SHALL BE CUT PRIOR TO WELDING. WELD AND EDGE OF HOLE IN THE PIPE ARE TO BE GROUND TO SUIT CONTOUR OF OUTLET.
3. BRANCH MUST BE ONE SIZE SMALLER THAN MAIN.

PIPING CLASS		SIZE	MAX. PRESSURE	MAX. TEMP. °F
I	II			
YES	YES	2 1/2" & ABOVE	600	775

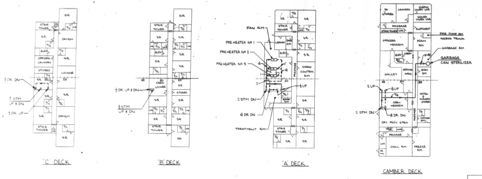
I.P.S.	"L" MAX
2 1/2"	4"
3"	5"
3 1/2"	6"
4"	7"
5"	8"
6" & UP	10"

HULL NO. 613-6150	DWG. NO. 2502-140	REV. B
		SHEET 10

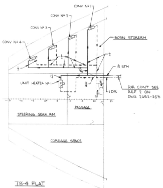
2502-140

SEPT. '80

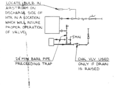
6X


½ DR DN
½ STM UP & DN
½ DR UP
STAIR TOWER
SR
DAYRM
ELEV
OFFICERS LAUNDRY
STORES
LOUNGE
T/S
"C" DECK
½ DR UP & DN
½ STM UP & DN
CREW LOUNGE
WR
LKR
"B" DECK
FAN RM
PREHEATER № 1
PREHEATER № 2
PREHEATER № 3
2 STM DN
1¼ DR DN
TREATMENT RM
LIBRARY
DARK RM
PASSAGE
CARGO CONTROL RM
BAGG RM
½ UP
"A" DECK
DRY STORES
LAUNDRY
CLEAN LINEN LKR
SOILED LINEN LKR
SLOPCHEST
FIRE PUMP RM ACCESS TRUNK
FOAM RM
OFFICERS MESSRM
GARBAGE RM
GARBAGE CAN STERILIZER
LOBBY
GALLEY
SERVING AREA
GYRO RM
2 UP
1¼ UP
2 STM DN
1¼ DR DN
CREW MESSRM
HOTEL & SUNDRY STORES
CHANGE RM
DRY PROV STRM
CHILL RM
FREEZE RM
CAMBER DECK

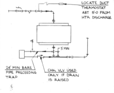
SERVICE STEAM DIAGRAM
ENGINEERS OPERATING MANUAL
SHEET №


CONV № 1
CONV № 2
CONV № 3
CONV № 4
BOSN STORERM
1½ STM
UNIT HEATER № 1
1 DR
FOR CONT SEE REF 2 ON DWG 2652-253
PASSAGE
STEERING GEAR RM
CORDAGE SPACE

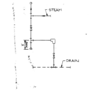
78'-4 FLAT


LOCATE BULB IN AIRSTREAM ON DISCHARGE SIDE OF HTR IN A LOCATION WHICH WILL INSURE PROPER OPERATION OF VALVE
5' MIN
24" MIN BARE PIPE PRECEEDING TRAP
CHK VLV USED ONLY IF DRAIN IS RAISED

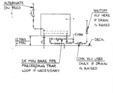
TYPICAL HOOKUP FOR UNIT HEATERS


LOCATE DUCT THERMOSTAT ABT 8'-0 FROM HTR DISCHARGE
5' MIN
24" MIN BARE PIPE PRECEEDING TRAP
CHK VLV USED ONLY IF DRAIN IS RAISED

TYPICAL HOOKUP FOR PREHEATERS


STEAM
DRAIN

TYPICAL STEAM DRIP


ALTERNATE DN FEED
SHUTOFF VLV HERE IF DRAIN IS RAISED
5' MIN
12" MAX 6" MIN
DECK
24" MIN BARE PIPE PRECEEDING TRAP, LOOP IF NECESSARY
CHK VLV USED ONLY IF DRAIN IS RAISED

TYPICAL HOOKUP FOR CONVECTORS

FOR LIST OF MATERIAL NOTES AND REFERENCES SEE NEWPORT NEWS DRAWING 2652-253

⊣⊢	UNION JOINT
DR	CONDENSATE DRAIN
STM	STEAM SUPPLY
	THERMOSTATIC TRAP
	THERMOSTATIC FLOAT & TRAP
	STRAINER
	DIRT LEG
	PET COCK
	TEMP REGULATOR VALVE
	SWING CHECK VALVE
⋈	GATE VALVE
	GLOBE VALVE
R	REHEATER
P	PREHEATER
C	CONVECTOR

LIST OF SYMBOLS

SERVICE STEAM DIAGRAM
ENGINEERS OPERATING MANUAL
SHEET №

1

REVISIONS

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTH	OWNER DATE	OWNER APPD
A	–	INITIAL ISSUE	–	–	–	–
B	-	"TYPICAL HOOK-UP FOR CONVECTOR" WYE STRAINER ADDED DOWNSTREAM OF CONVECTOR TO SUIT SPECIFICATIONS. TITLE BLOCK - APPROVAL LETTER DATES ADDED. DWM	1-12-78			

AUTHORITY:

GENERAL NOTES:

DWG. REV. — HULL APPLIC

REV	NN HULLS ONLY					
A	YES	YES	YES			
B	YES	YES	YES			

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS REV "B"
DATE 12-2-78 SIGNED

YARD PRINTS

ORDERED BY DESIGN

GROUP:
MC NO.

NN S & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS	SHELL LTR 1200V DATED 11-10-76	ABS	FILE T8-2 DATED 12-1-76
	ZAPATA LTR DATED 12-28-76	USCG	SER: 3441 DATED 10-27-76

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV. COMMERCIAL DESIGN DEPT.
FSCM NO. 43689

SCALE ______ = 1 FT
DRAWN L.L. CHASE
CHECKED —
SECT MGR
DATE COMPL. —
EXAMINED —
AUTHORIZED
DATE 9-6-76
TECH APPROVAL
C S D APPROVAL

390,000 D.W.T. TANKER
SERVICE STEAM DIAGRAM
ARRANGEMENT

U S M A DESIGN
U S M A DWG NO.
HULL NO.

DWG NO. 2652-252
REV B
SHEET NO. 1 OF 1

NO.	REFERENCES	DWG NO.

D

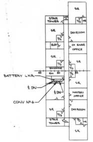
C

B

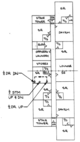
A

2652-252

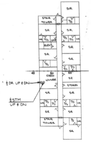
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
FRAME 1
10X


STAIR TOWER
SR
DAYROOM
ELEV
CH ENGR OFFICE
BAGGAGE RM
T/S
BATTERY LKR
½ DN
½ DN
CONV Nº 6
MASTERS OFFICE
45
50
55

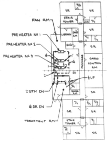
"D" DECK


STAIR TOWER
SR
DAYRM
ELEV
OFFICERS LAUNDRY
STORES
LOUNGE
½ DR DN
½ STM UP & DN
½ DR UP
T/S
55

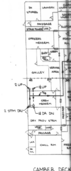
"C" DECK


STAIR TOWER
SR
ELEV
CREW LOUNGE
STORES
T/S
½ DR UP & DN
½ STM UP & DN
45
50
55

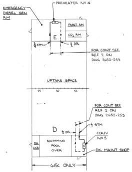
"B" DECK


FAN RM
PREHEATER Nº 1
PREHEATER Nº 2
PREHEATER Nº 3
STAIR TOWER
LIBRARY
CARGO CONTROL RM
PASSAGE
2 STM DN
1½ DR DN
1½ UP
TREATMENT RM
SR
T/S
50

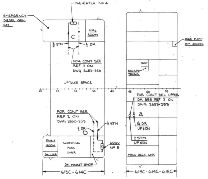
"A" DECK


DK STORES
LAUNDRY
PASSAGE
STAIR TOWER
OFFICERS MESSRM
ELEV
GALLEY
SERVING AREA
2 UP
1½ UP
2 STM DN
CREW MESSRM
1½ DR DN
DRY PROV STRM
PASSAGE
CHILL RM

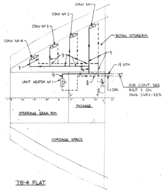
CAMBER DECK


PREHEATER Nº 4
EMERGENCY DIESEL GEN RM
PAINT RM
CO₂ RM
E
¾ STM
½ DR
FOR CONT SEE REF 2 ON DWG 2652-253
UPTAKE SPACE
25
30
35
FOR CONT SEE REF 2 ON DWG 2652-253
½ STM
D
½ DR
CONV Nº 5
DK LKR
SWIMMING POOL OVER
DK MAINT SHOP
615C ONLY

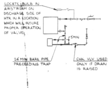
UPPER DECK


PREHEATER Nº 4
EMERGENCY DIESEL GEN RM
C
CO₂ ROOM
¾ STM
½ DR
FOR CONT SEE REF 2 ON DWG 2652-253
UPTAKE SPACE
FIRE PUMP RM ACCESS
ELEV
ESCAPE TRUNK
20
25
30
35
40
45
50
55
FOR CONT BEL UPPER DK SEE REF 2 ON DWG 2652-253
A
1½ DR UP & DN
2 STM UP & DN
FOR CONT SEE REF 2 ON DWG 2652-253
½ DR
½ STM
D
CONV Nº 5
PAINT ROOM
DK LKR
SWIMMING POOL OVER
DK MAINT SHOP
MISC DECK LKR
613C-614C
613C-614C-615C

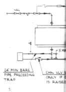
UPPER DECK


CONV Nº 1
CONV Nº 2
CONV Nº 3
CONV Nº 4
BOSN STORERM
½
½
½
1½ STM
1¼
UNIT HEATER Nº 1
¾
1 DR
FOR CONT SEE REF 2 ON DWG 2652-253
AP
5
10
15
20
25
PASSAGE
STEERING GEAR RM
CORDAGE SPACE

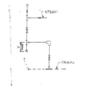
78'-4 FLAT


LOCATE BULB IN AIRSTREAM ON DISCHARGE SIDE OF HTR IN A LOCATION WHICH WILL INSURE PROPER OPERATION OF VALVE
5 MIN
24" MIN BARE PIPE PRECEEDING TRAP
CHK VLV USED ONLY IF DRAIN IS RAISED

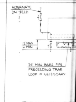
TYPICAL HOOKUP FOR UNIT HEATERS


5 MIN
24" MIN BARE PIPE PRECEEDING TRAP
CHK VLV
ONLY IF
IS RAISED

TYPICAL HOOKUP FOR P


STEAM
5"
DRAIN

TYPICAL STEAM DRIP


ALTERNATE DN FEED
12" MAX
6" MIN
24" MIN BARE PIPE PRECEEDING TRAP, LOOP IF NECESSARY

TYPICAL HOOKUP FO

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FRAME 2

10X

2652.253

CSD VAULT Q

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APP'D.
		SEE SHEET 2				

REV. STATUS OF SHEETS								
REV.	B	B	A	B	B	B	B	A
SHEET	1	2	3	4	5	6	7	8

GROUP

MC NO.

DWG. REV. — HULL APPLIC.

REV.	NN HULLS ONLY 613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES

NNS & DD Co. HULL NO.	MARAD HULL NO.	USMA DESIGN	SHIP'S NAME
615C	311		
614C	310		
613C	309		

APPROVALS

OWNERS SHELL LTR 1200V DATED 11-10-76	ABS T8-2 DATED 12-1-76
ZAPTA LTR DATED 12-28-76	USCG SER: 3441 DATED 10-27-76

Newport News Shipbuilding
A Tenneco Company
TENNECO
Commercial Ship Division
FSCM NO. 43689
DESIGN DIVISION DEPT. COMMERCIAL DESIGN

SCALE: NONE = 1 Ft.
DRAWN: L.L. CHASE
CHECKED: —
SECT. MGR. V.R. Schellenberg
DATE COMPL. —
EXAMINED: —
AUTHORIZED: E.E. Stephenson
DATE 9-6-76
TECH. APPROVAL SAW 9/3/76
CSD APPROVAL R. L. Harrington

TITLE 390,000 DWT TANKER
SERVICE STEAM DIAGRAM
LIST

DWG. NO. 2652-253
REVISION B
SHEET NO. 1 OF 8

M7 11 X 17

GROUPED BY CHK.
DATES COMP. PART
HULL ___ GROUP NO. KEY
TYPE OF DWG.

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS REV "B"
DATE 12-6-78 SIGNED J. Mcanon

SPECIAL PRINTS

DATE ISSUED	REV.
9-17-76	
1-18-78	
12-6-78	B

YARD PRINTS

FIRST ISSUE	DEPT.	NO. PRINTS
	AH	
	BL	
	BR	
	EL	
	FP	
	MI	
	ML	
	MS	
	PC	
	PM	
12-6-78	PS	12
	PN	
	RD	
	RM	
	MIR	
	SH	
	SM	
	TM	
	WD	
	WE	
	WM	
	X16	

ORDERED BY DESIGN

FIRST ISSUE	DEPT.	NO. PRINTS
12-6-78	CSD-V	1
	K50	1
	RO(SEPIA)	1
	JEA	

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4X

REVISIONS

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		OWNERS	
NN	OWNER					DATE	AUTHD	DATE	APPD
—	—	A	-	-	INITIAL ISSUE	—	—	—	—
	B		1	—	TITLE BLOCK- APPROVAL LETTER DATES ADDED.				
			4	-	NOTE NO. 5 MODIFIED FOR CLARITY AND NOTE NO. 27 ADDED TO SUIT REGULATORY BODIES.				
			5	-	"APPLICABLE DOCUMENTS" FOR "FLANGE BOLTING" MODIFIED FOR CLARITY TO SUIT REGULATORY BODIES.				
			6		"END CONN" COLUMN MODIFIED FOR CLARITY TO SUIT REGULATORY BODIES.				
					"MAT'L SPEC" FOR V-7- MODIFIED WALWORTH NUMBER. DESIGN DEV.				
					"MAT'L SPEC" FOR V13 THRU V19 – MATERIAL MADE B61 IN LIEU OF B62. DESIGN DEV.				
					"MAT'L SPEC" FOR V-20 – MATERIAL MADE B61 IN LIEU OF B62 AND WALWORTH NUMBER MODIFIED. DESIGN DEV.				
					"SIZE" FOR V22 AND V23 ADDED.				
			7	-	"END CONN" COLUMN MODIFIED FOR CLARITY TO SUIT REGULATORY BODIES.				
					"SIZE" FOR V24 ADDED.				
					"MAT'L SPEC" FOR V30 THRU V33 - MODIFIED WALWORTH NUMBER. DESIGN DEV.				
					"MAT'L SPEC" FOR V37 - MATERIAL MADE B61 IN LIEU OF B62. DESIGN DEV.				
					VALVE V43 ADDED. 1-6-78 DWM	1-12-78			

HULL NO. 613C, 614C, 615C
DWG. NO. 2652-253
REV. B
SHEET 2

K&E 19 1253 3-75 3033A•

MN11-11 X 17 (REV. 1)

2652-253

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TABLE OF CONTENTS	
SH NO.	TITLE
1	TITLE SHEET
2	REVISIONS
3	TABLE OF CONTENTS & REFERENCES
4	GENERAL NOTES
5	MATERIAL SCHEDULE
6	VALVE LIST
7	VALVE LIST
8	FLOW DATA

REFERENCES		
NO.	TITLE	DWG NO.
1	[redacted]	[redacted]
2	DIAGRAM - CONTAMINATED STM GENERATING SYSTEM	6450-692
3	DIRECTIONS FOR INSULATING & LAGGING OF PIPES & AUX [redacted]	257322
4	TYPICAL ARRANGEMENT OF GAGE PIPING	6750-481
5	STANDARD PIPE HANGERS & INSTALLATION INSTRUCTIONS	257056
6	VENTILATION - LIST OF FANS, HEATERS, COOLING COILS & CONV	2685-117
7	[redacted]AMBER DK & ABOVE	2652-260
8	VENTILATION - HEATING & COOLING LOAD CALCULATIONS	2680-578
9	↓ - HEATING & AIR COND DIAGRAM - QUARTERS AREA	2680-580
10	↓ ↓ ↓ ↓ - EXCLUSIVE OF QUARTERS AREA	2680-579
11	SERVICE STM ARRGT - STEERING GEAR FLAT	2652-254
12	[redacted]	[redacted]
13	[redacted]	[redacted]

HULL NO. 613C, 614C, 615C	DWG. NO. 2652-253	REV. A
		SHEET 3

K&E 19 1253 10-71 2236+

NN12-11 X 17 (REV. 1)

2652-253

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2652-253

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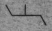
GENERAL NOTES

1- PIPE SIZES SPECIFIED ARE NOMINAL I.P.S. OUTSIDE DIAMETER.
2- THE ORDERED THICKNESS IS BASED ON A MINIMUM BEND OF 5 DIAMETERS.
3- WHERE PIPING IS SUBJECT TO MECHANICAL INJURY, IT SHALL BE ADEQUATELY PROTECTED.
4- CONDENSATE PIPING SHALL BE DESIGNED FOR GRAVITY RETURN.
Ⓑ 5- SWING CHECK VALVES ARE TO BE INSTALLED IN A FORE & AFT DIRECTION ONLY. DRAIN PIPING SHOULD NOT BE ELEVATED MORE THAN ONE DECK HEIGHT ABOVE THE CONVECTOR OR HEATER INVOLVED.
6- PROVISION FOR EXPANSION IN STEAM LINES SHALL BE MADE BY MEANS OF OFFSETS OR "U" BENDS.
7- BRANCHES FROM STEAM MAINS TO BE TAKEN FROM ABV THE HORIZONTAL CENTER LINE OF MAINS WHERE POSSIBLE.
8- CUTS THRU NON-TIGHT BULKHEADS, TRANSVERSES & LONGITUDINALS TO ALLOW FULL THICKNESS OF INSULATION OF PIPES UNLESS OTHERWISE NOTED ON PLAN.
9- ALL PIPING SHALL BE SUITABLY PITCHED TO FACILITATE DRAINAGE. POCKETS TO BE AVOIDED AS MUCH AS POSSIBLE. DRIPS SHALL BE PROVIDED AT ALL LOW POINTS, PROPERLY TRAPPED, SEE 2652-252.
10- EACH PIECE OF HEATING EQUIPMENT SHALL BE PROVIDED WITH A CUTOUT VALVE IN THE STEAM SUPPLY LINE AT THE UNIT.
11- THIS PLAN DEVELOPED IN ACCORDANCE WITH:
  1- A.B.S. RULES FOR BUILDING & CLASSING STEEL VESSELS, SECT 36.
  2- U.S. COAST GUARD SUB-CHAPTER F.

12- LEADS OF PIPE SHOWN ARE DIAGRAMMATIC ONLY. FINAL LEADS SHALL BE DIRECT AS PRACTICABLE WITH NECESSARY PROVISIONS FOR EXPANSION, ANCHORAGE & SUPPORT.
13- DRAIN CONNECTIONS SHALL BE INSTALLED AT ALL POCKETS IN STEAM DRAIN MAIN PIPING TO PERMIT REMOVAL OF WATER WHEN THE SYSTEM IS NOT IN OPERATION.
14- STEAM FOR ALL HEATING EQUIP TO BE TAKEN FROM CONTAMINATED STM GENERATOR IN MACHINERY SPACE & REDUCED TO 40 # PSIG. SEE REF 2.
15- PIPES PASSING THRU JOINER OR NON-TIGHT BHDS SHALL HAVE NEAT FITTING COLLAR PLATES AROUND THE PIPES.
16- ALL PIPING IN LOCATIONS SUBJECT TO FREEZING SHALL BE INSTALLED SO THAT THE PIPING MAY BE THOROUGHLY DRAINED.
17- TYPICAL HOOKUPS FOR EQUIPMENT ARE SHOWN ON SERVICE STM DIAGRAM, N.N. DWG 2652-252
18- INSULATION & LAGGING REQUIREMENTS SHALL BE IN ACCORDANCE WITH REF 3.
19- VALVES MARKED THUS ON FACE OF PLAN SHALL BE INSTALLED AS FOLLOWS:

FLUID ON THIS SIDE IS ISOLATED FROM THE STEM PACKING WITH THE VALVE CLOSED.



FLUID ON THIS SIDE IS IN CONTACT WITH THE STEM PACKING WITH THE VALVE CLOSED.

20- FOR GAGE PIPING SEE REF 4.
21- PIPING SHALL BE THOROUGHLY CLEANED BEFORE INSTALLATION. AFTER INSTALLATION THE SYSTEM SHALL BE CLEANED BY FLUSHING WITH WATER.
22- PIPE HANGERS TO BE IN ACCORDANCE WITH REF 5.
23- SEE REF 6 FOR LIST OF HEATERS & KONVECTORS.
24- FOR ARRANGEMENT OF SERVICE STEAM PIPING SEE REF 1,7 & 11. REF 1 & 11 ARE FURN BY NEWPORT NEWS, REF 7 FURN BY HOPEMAN.
25- LETTERS 'A', 'B' ETC SHOWN ON PIPE RUNS ARE FOR USE WITH FLOW TABLE ON SHEET 8
26- THE THICKNESS SHOWN IN THE "CALC MIN THK" COLUMN OF THE PIPE LIST IS THE MINIMUM THICKNESS ALLOWABLE AFTER ALL PIPE END PREPARATION IS COMPLETED & IS IN ACCORDANCE WITH U.S. COAST GUARD MINIMUM THICKNESS REQUIREMENTS.
Ⓑ 27- WHERE ASTM B61 OR B62 IS USED, CERTIFICATION IS MANDATORY AND ONE CHEMICAL TEST AND ONE TENSION TEST IS REQUIRED FROM EACH HEAT.

HULL NO. 613C, 614C, 615C	DWG. NO. 2652-253	REV. B
		SHEET 4

MN 13-11X17 (REV. 1)

MATERIAL SCHEDULE

SERVICE	ITEM	TYPE	SIZE	MATERIAL	APPLICABLE DOCUMENTS	REMARKS
STEAM HEATING SUPPLY & DRAINS ↓	PIPES		ALL SIZES	SEAMLESS DRAWN STEEL SCH 40	ASTM A 53 GRADE "B"	
	JOINTS	UNION-SCREWED	$1\frac{1}{2}$" & BEL	MALLABLE IRON	ANSI B16.3-71 ASTM A197-71	
		150# SLIP ON FLANGE	2" & ABV	CARBON STEEL	ANSI B16.5-73 ASTM A105-71	
	VALVES	200# SCREWED ENDS	$1\frac{1}{2}$" & BEL	BODY - BRONZE TRIM - BRONZE	ASTM B61 ASTM B62	
		125# FLANGED	2" & ABV	BODY-CAST IRON TRIM - BRONZE	ANSI B16.1 ASTM A126, CL "B"	
	FITTINGS	SCREWED ENDS	$1\frac{1}{2}$" & BEL	MALLABLE IRON	ANSI- B16.3-73, 150# ASTM A197-71	
		BUTT WELDED	2" & ABV	CARBON STEEL	ANSI B16.9-71, ANSI B16.28-64 SCH 40, ASTM A234-73	
		150# FLANGED			ANSI B16.5-73 ASTM A216-70, GR B	
	GASKETS	SHEET	ALL	COMP ASBESTOS	COMMERCIAL - $\frac{1}{16}$ THICK	
	FLANGE BOLTING	BOLTS - NUTS	ALL	STEEL	ASTM-A307-68 (MATERIAL) ANSI B1.1 (THREADS) ↓ B18.2.1 (HEX HEADS) B18.2.2	Ⓑ

PIPE LIST

NOM SIZE	CALC MIN THK*	ORDERED THK**	SCHEDULE
$\frac{1}{2}$	.069	.109	40
$\frac{3}{4}$	.070	.113	↓
1	.072	.133	
$1\frac{1}{4}$	.074	.140	
$1\frac{1}{2}$	.075	.145	
2	.077	.154	

* SEE NOTE 26

** SEE NOTE 2

HULL NO. 613C, 614C, 615C	DWG NO. 2652-253	REV. B
		SHEET 5

K&E 191375 8-74 W 2647A•

MN 13-11X17 (REV. 1)

2652-253

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
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SEPT. '80

4X

VALVE LIST

REV	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANS PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE			REMARKS	MATL. SPEC.
A	V1	1	½	GLOBE	BRONZE	200	SCRD ANSI B16.15	BRONZE	CONVECTOR Nº	1	STEAM SHUT OFF		ASTM B61 WALWORTH 160 OR EQ
A	V2	1	½	↓	↓	↓	↓	↓	↓	2	↓		↓
A	V3	1	½	↓	↓	↓	↓	↓	↓	3	↓		↓
A	V4	1	½	↓	↓	↓	↓	↓	↓	4	↓		↓
A	V5	1	½	↓	↓	↓	↓	↓	↓	5	↓		↓
A	V6	1	½	↓	↓	↓	↓	↓	↓	6	↓	FURN BY HOPEMAN	↓
B	V7	1	½	GATE	↓	↓	↓	↓	↓	1	DRAIN CUTOFF		ASTM B61 WALWORTH 4 OR EQ
B	V8	1	½	↓	↓	↓	↓	↓	↓	2	↓		↓
B	V9	1	½	↓	↓	↓	↓	↓	↓	3	↓		↓
B	V10	1	½	↓	↓	↓	↓	↓	↓	4	↓		↓
B	V11	1	½	↓	↓	↓	↓	↓	↓	5	↓		↓
B	V12	1	½	↓	↓	↓	↓	↓	↓	6	↓	FURN BY HOPEMAN	↓
B	V13	1	½	SWING CHECK	↓	↓	↓	↓	↓	1			ASTM B61 WALWORTH 406 OR EQUAL
B	V14	1	½	↓	↓	↓	↓	↓	↓	2			↓
B	V15	1	½	↓	↓	↓	↓	↓	↓	3			↓
B	V16	1	½	↓	↓	↓	↓	↓	↓	4			↓
B	V17	1	½	↓	↓	↓	↓	↓	↓	5			↓
B	V18	1	¾	↓	↓	↓	↓	↓	UNIT HEATER Nº	1			↓
B	V19	1	1¼	GLOBE	↓	↓	↓	↓	↓	↓	STEAM SHUT OFF		ASTM B61 WALWORTH 160 OR EQ
B	V20	1	¾	GATE	↓	↓	↓	↓	↓	↓	DRAIN CUT OFF		ASTM B61 WALWORTH 4 OR EQ
A	V21	1	1½	TEMP REGULATING	↓	↓	↓	↓	↓	↓	STEAM CONTROL		
B	V22	1	1½	↓	↓	↓	↓	↓	PREHEATER Nº	1	↓	FURN BY HOPEMAN	
B	V23	1	1½	↓	↓	↓	↓	↓	↓	↓ 2	↓	↓	

HULL NO. 613C, 614C, 615C	DWG. NO. 2652-253
	SHEET 6 OF 8

K&E 19 1253 11-72 2491A+

MN13-11X17

2652-253

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

4X

VALVE LIST

REV	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANS PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE			REMARKS	MATL. SPEC.
B	V24	1	1¼	TEMP REGULATING	BRONZE	200	SCRD ANSI B16.15	BRONZE	PREHEATER NO.	3	STEAM CONTROL	FURN BY HOPEMAN	
A	V25	1	1	↓	↓	↓	↓	↓	↓	4	↓		
A	V26	1	1¼	GLOBE	↓	↓	↓	↓	↓	1	STEAM SHUTOFF	FURN BY HOPEMAN	ASTM B61 WALWORTH 160 OR EQ
A	V27	1	1¼	↓	↓	↓	↓	↓	↓	2	↓	↓	↓
A	V28	1	1	↓	↓	↓	↓	↓	↓	3	↓	↓	↓
A	V29	1	¾	↓	↓	↓	↓	↓	↓	4	↓		↓
B	V30	1	1	GATE	↓	↓	↓	↓	↓	1	DRAIN CUT OFF	FURN BY HOPEMAN	ASTM B61 WALWORTH 4. OR EQ
B	V31	1	1	↓	↓	↓	↓	↓	↓	2	↓	↓	↓
B	V32	1	½	↓	↓	↓	↓	↓	↓	3	↓	↓	↓
B	V33	1	½	↓	↓	↓	↓	↓	↓	4	↓		↓
A	V34	1	1	SWING CHECK	↓	↓	↓	↓	↓	1		FURN BY HOPEMAN	ASTM B62 WALWORTH 406 OR EQUAL
A	V35	1	1	↓	↓	↓	↓	↓	↓	2		↓	↓
A	V36	1	½	↓	↓	↓	↓	↓	↓	3		↓	↓
B	V37	1	½	↓	↓	↓	↓	↓	↓	4			ASTM B61 WALWORTH 406 OR EQ
A	V38	1	¼	PET COCK	↓	↓	↓	↓	↓	1	AIR VENT	FURN BY HOPEMAN	ASTM B62 WALWORTH 557 OR EQUAL
A	V39	1	¼	↓	↓	↓	↓	↓	↓	2	↓	↓	↓
A	V40	1	¼	↓	↓	↓	↓	↓	↓	3	↓	↓	↓
A	V41	1	¼	↓	↓	↓	↓	↓	↓	4	↓		↓
A	V42	1	¾	GLOBE	↓	↓	↓	↓	STM CUTOFF TO GARB. CAN STER.			FURN BY HOPEMAN	ASTM B61 WALWORTH 160 OR EQ
B	V43	1	¼	PET COCK	↓	↓	↓	↓	UNIT HEATER NO. 1 AIR VENT				ASTM B62 WALWORTH 557 OR EQ

HULL NO. 613C, 614C, 615C	DWG. NO. 2652-253	
		SHEET 7 OF 8

K&E 19 1253 11-72 2491A•

MN13-11X17

DESIGN CHARACTERISTICS					
SERVICE	WORKING PRESSURE	WORKING TEMP	DESIGN PRESS.	DESIGN TEMP.	HYDRO TEST PRESS.
STEAM SUPPLY	40 PSIG	335° F (613C-614C) 320° F (615C)	50 PSIG	350° F	75 PSIG
DRAINS	0-40 PSIG	212° F	50 PSIG	300° F	75 PSIG

FLOW DATA TABLE						
SYM	SIZE INCHES	NOM PRESS.	FLOW LB/HOUR	VEL FT/SEC	CONDITION	SERVICE
A	2	35 PSIG	998	101	RATED	DECK HOUSE
B	1½	↓	404	67	↓	STEERING GEAR FLAT
C	¾		116	74		UPPER DECK(P) 613C-614C
D	½		16	18		UPPER DECK(S)
E	¾		113	72		UPPER DECK(P) 615C

HULL NO. 613C, 614C, 615C	**DWG NO.** 2652-253	**REV.** A
		SHEET 8

K&E 191355 8-74 W 2647A

MN 13-11X17 (REV. 1)

2652-253

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
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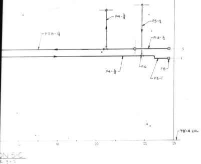
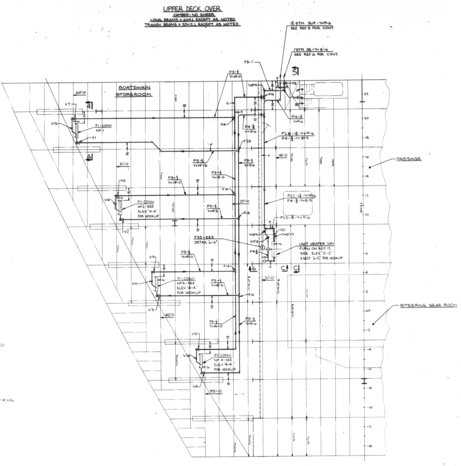
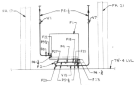
SEPT. '80

4X


P4-¾
P5-½
P2B-1½
P1A-1½
F16
F8
P4-¾
P3-1
78'-4 LVL
18
20
22
23
ON 5-C


UPPER DECK OVER
CAMBER-NO SHEER
LONG BEAMS = 6x4L EXCEPT AS NOTED
TRANSV BEAMS = 37x12L EXCEPT AS NOTED
1½ STM SUP-Y=9'-6
SEE REF 3 FOR CONT.
1 STM DR-Y=8'-6
SEE REF 6 FOR CONT.
P3-1
P5-½
Y=14'-0
5
F8
F16
BOATSWAIN
STOREROOM
60'-0
V7
4
V13
F1-CONV
Nº 1
V1
F14
P4-¾
Y=13'-6
P1A-1½
Y=9'-6
P2B-1½-Y=9'-6
P4-¾-Y=8'-9
F28
A
P5-½
Y=14'-3
P5-½
Y=13'-6
18'-0
PASSAGE
51'-0
V8
P5-½
Y=14'-0
P5-½
Y=14'-0
F14
V14
F1-CONV
Nº 2-SEE
ELEV "4-A"
FOR HOOKUP
27'-0
P5-½
Y=14'-3
F14
V2
P2C-1½-Y=9'-6
P4-¾-Y=8'-9
P2D-1½-Y=9'-6
V21
Y=10'-7
F33-SEE
DETAIL "6-A"
UNIT HEATER Nº1
FURN ON REF 12
SEE ELEV "5-C"
& SECT "6-C" FOR HOOKUP
6
C
V9
P5-½
Y=14'-0
F14
V15
F1-CONV
Nº 3-SEE
ELEV "4-A"
FOR HOOKUP
P5-½
Y=14'-3
F14
21'-0
V3
42'-0
STEERING GEAR ROOM
P5-½
Y=14'-0
P5-½
Y=13'-6
V10
V16
F1-CONV
Nº 4-SEE
ELEV "4-A"
FOR HOOKUP
V4
33'-0
22
20
18
16
14
12
10
6
4
2
AP
-2
-4
-6
-8
-10
-12
-14

PLAN VIEW 78'-4 LEVEL
NO CAMBER-NO SHEER
MOLDED DK HEIGHT AT ℄ = 21'-0"
SCALE: ½ = 12


FR 17
P5-½
FR 21
V1
V7
F1
F22
P5-½
F18
F8
F27
F4
F25
P4-¾
F2
78'-4 LVL
P4-¾
F20
V13
P5-½
F23
F38

ELEVATION "4-A"
SCALE: ½ = 12
SAME FOR CONV 1, 2, 3 & 4

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
A	-	INITIAL ISSUE	—	—	—	—

AUTHORITY:

GENERAL NOTES:

1- ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE U.S.C.G. & A.B.S. SEE REF 2 FOR LIST OF ACCEPTABLE MATERIALS.

2- ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS & SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. & REF 9.

3- PAINTING IS IN ACCORDANCE WITH REF 10 & 11.

4- TESTS & CLEANING TO BE IN ACCORDANCE WITH REF 2.

5- PIPE HANGERS TO BE IN ACCORDANCE WITH REF 8.

6- INSULATION & LAGGING TO BE IN ACCORDANCE WITH REF 7.

7- CUTS THROUGH NON-TIGHT BHDS TO ALLOW FULL THICKNESS OF INSULATION & SHALL HAVE NEAT FITTING COLLAR PLATES.

8- FLEXIBLE TUBING BETWEEN STEAM CONTROL VALVE (V21) & THERMOSTATIC BULB TO BE LED AS DIRECTLY AS POSSIBLE IN PROTECTED LOCATIONS. WHERE TUBING MAY BE EXPOSED TO MECHANICAL INJURY, #16 USSG SHEET GUARDS SHALL BE PROVIDED.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
COMMERCIAL DESIGN DEPT.

NO.	REFERENCES	DWG NO.
12	VENTILATION ARRANGEMENT STEERING GEAR FLAT	2680-587
11	PAINTING SCHEDULE (H615C ONLY)	8300-41
10	PAINTING SCHEDULE (H613C-614C)	8300-40
9	FAB. & WELDING INSTRUCTIONS, CLASS I & II PIPING	257035
8	STD PIPE HANGERS & INSTALLATION INSTRUCTIONS	257066
7	DIRECTIONS FOR INSUL & LAGGING PIPES	257322
6	PIPING ARRGT CONTAM STM SYS-ENGINE ROOM	6450-743
5	SERVICE STEAM STEERING GEAR FLAT-PIPE DETAILS	-256
4	SERVICE STEAM STEERING GEAR FLAT-BILL OF MATERIAL	-255
3	PIPING ARRGT HEATING STEAM SYS ENGINE RM	-262
2	SERVICE STEAM DIAGRAM -LIST	-253
1	SERVICE STEAM DIAGRAM-ARRANGEMENT	2652-252

SCALE ¼ & ½ = 1 FT
DRAWN L.L. CHASE
CHECKED
SECT MGR F.R. Schettenberg
DATE COMPL. 2/11/77
EXAMINED
AUTHORIZED E.E. Hopkins
DATE 2-11-77
TECH APPROVAL
CSD APPROVAL R. L. Harrington

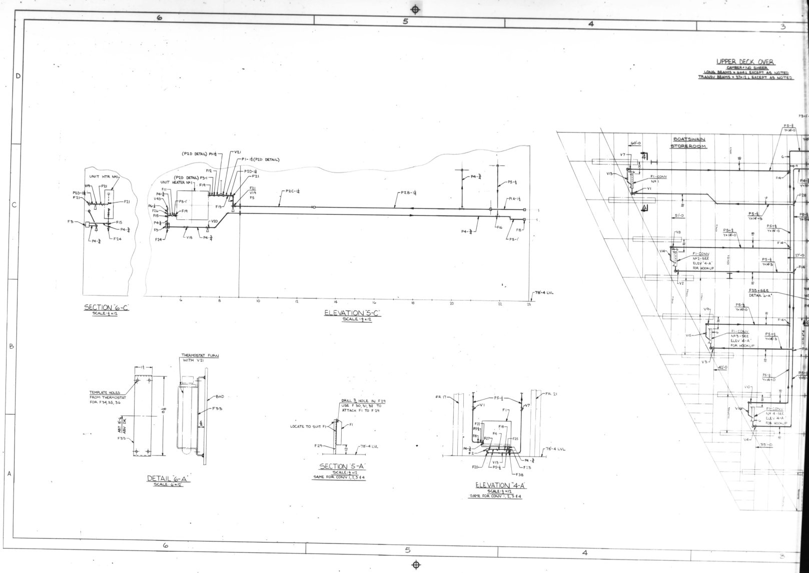
390,000 D.W.T. TANKER
SERVICE STEAM ARRANGEMENT
STEERING GEAR FLAT

USMA DESIGN
USMA DWG NO.
HULL NO.
DWG NO. 2652-254
REV A
SHEET NO. 1 OF 1

DWG. REV — HULL APPLIC
REPRODUCTION OFFICE
YARD PRINTS YES GROUPING YES
REMARKS NEW DRAWING
DATE 2/11/77
GROUP:
MC NO.

2652-254

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 1
10X


6
5
4
3
D
C
B
A
UPPER DECK OVER
CAMBER = NO SHEER
LONG BEAMS = 6x4½ EXCEPT AS NOTED
TRANSV BEAMS = 3⅞x12½ EXCEPT AS NOTED
BOATSWAIN STOREROOM
60'-0
51'-0
27'-0
42'-0
35'-0
F1-CONV Nº1
F1-CONV Nº2-SEE ELEV "4-A" FOR HOOKUP
F1-CONV Nº3-SEE ELEV "4-A" FOR HOOKUP
F1-CONV Nº4-SEE ELEV "4-A" FOR HOOKUP
F35-SEE DETAIL "6-A"
P5-½ Y=14'-0
UNIT HTR Nº1
UNIT HEATER Nº1
(P2D DETAIL) P1-1½
P1-1½ (P2D DETAIL)
(P2D DETAIL) P3-1
P2D-1½
P2C-1¼
P2B-1¼
P1A-1¼
P4-¾
P5-1
78'-4 LVL
SECTION "6-C"
SCALE: ½=12
ELEVATION "5-C"
SCALE: 1½=12
THERMOSTAT FURN WITH V21
TEMPLATE HOLES FROM THERMOSTAT FOR F34, 35, 36
ABT 5'-6 ABV DK
BHD
F33
DETAIL "6-A"
SCALE: 6=12
DRILL ⅜ HOLE IN F29 USE F30, 31, 32 TO ATTACH F1 TO F29
LOCATE TO SUIT F1
SECTION "5-A"
SCALE: ½=12
SAME FOR CONV 1, 2, 3 & 4
FR 17
FR 21
ELEVATION "4-A"
SCALE: ½=12
SAME FOR CONV 1, 2, 3 & 4

2652-254

MICRO-MASTER® 105 mm

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SEPT. '80

FRAME 2

10X

2652-255

CSD VAULT
E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS REV "B"
GROUPING YES
DATE 12-16-77
SIGNED

YARD PRINTS | ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS						
REV.	B	B	B	B	B	B
SHEET	1	2	3	4	5	6

GROUP
MC NO.

NNS&DDCO HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C	311		
614C	310		
613C	309		

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
DESIGN DIVISION DEPT. COMMERCIAL DESIGN

SCALE — =1 Ft.
DRAWN L.L. CHASE
CHECKED —
SECT. MGR. R.R. Schellenberg
DATE COMPL. 3/11/77
EXAMINED —
AUTHORIZED E.E. Stephenson
DATE 3-11-77
TECH. APPROVAL
CSD APPROVAL R.L. Harrington

TITLE 390,000 D.W.T. TANKER
SERVICE STEAM STEERING GEAR FLAT
BILL OF MATERIAL

DWG. NO. 2652-255 REV B SHEET NO. 1 OF 6

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D	OWNER DATE	OWNER APPD.
A	—	INITIAL ISSUE	—	—	—	—
B	3-6	TITLE OF "QTY" COLUMN CHGD FROM "(3 SHIP)" TO "(1 SHIP)". SHT # 3, LINES # 1-17; SHT # 4, LINES # 1-19; SHT # 5, LINES # 1-3 & 5-16 AND SHT # 6, LINES # 1-19 QUANITY CHANGED FOR 1 SHIP ALL TO SUIT YARD REQUEST EHR	12-16-77	AC		

NO.	REFERENCES	DWG. NO.
1	SERVICE STEAM-STEERING GEAR FLAT-ARRANGEMENT	2652-254

HULL NO. 613C, 614C, 615C DWG. NO. 2652-255 SHEET 2 OF 6

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	10 LIN FT	P3	1" IPS STANDARD PIPE, STEEL	S 57-06-104	PS	
B		2	60 LIN FT	P4	3/4" ↓	S 57-06-103		
B		3	350 LIN FT	P5	1/2" ↓	S 57-06-102		
B		4	12"	P6	1/4" ↓	S 57-06-100		
B		5	1	H12	1" SWING HANGER	S 25-47-346	ST-PS	
B		6	12	H12	3/4" ↓	S 25-47-336		
B		7	70	H13	1/2" ↓	S 25-48-326		
B		8	1	P1-A	1 1/2" IPS STANDARD PIPE, STEEL	PMO 2652-256	PS	
B		9	1	P2-B	1 1/4" ↓	↓		
B		10	1	P2-C	↓	↓		
B		11	1	P2-D	↓	↓		
B		12	1	V19	1 1/4" GLOBE VALVE-BRZ-SCRWD	↓		
B		13	1	V21	1 1/2" STM CONTROL VALVE, SCRWD	↓		
B		14	1	V18	3/4" SWING CHECK VLV-BRZ-SCRWD	PO 2652-C7 ⑦	MD-PS	
B		15	1	V20	3/4" GATE VALVE-BRZ-SCRWD	PO 2652-C7 ⑤		
B		16	1	H12	1 1/2" SWING HANGER	S 25-47-366	ST-PS	
B		17	4	H12	1 1/4" ↓	S 25-47-356		
		18						

REMARKS -

SERVICE - PIPES & VALVES
PIPE HANGERS

PS-157
GROUP NO. 2652-0405-1001-PI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 2652-255 SHEET 3 REV. B

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	1	F3	3/4" COMB FLOAT, THERMOSTATIC TRAP	PO 2652-C3 ①	MD-PS	
B		2	1	F5	1 1/4" STRAINER	PMO-2652-256	PS	
B		3	40	F6	1/2" COUPLING, STL, SW	S 25-60-052	ST-PS	
B		4	6	F7	3/4" ↓	S 25-60-053		
B		5	1	F8	1" ↓	S 25-60-054		
B		6	1	F9	1 1/4" ↓	PMO-2652-256	PS	
B		7	1	F10	1 1/2" ↓	↓		
B		8	1	F11	1"-3/4" REDUCING COUPLING, STL, SW	S 25-60-184	ST-PS	
B		9	1	F12	1 1/2"-1" ↓	PMO-2652-256	PS	
B		10	1	F13	1 1/2"-1 1/4" ↓	↓		
B		11	5	F14	1/2" TEE, STL, SW	S 25-60-077	ST-PS	
B		12	2	F15	3/4" ↓	S 25-60-078		
B		13	1	F16	1"×3/4"×1/2" ↓	S 25-60-239		
B		14	1	F17	1 1/2"×1 1/4"×3/4" ↓	PMO-2652-256	PS	
B		15	2	F19	1" UNION, STL	S 25-12-198	ST-PS	
B		16	3	F21	1 1/4"-90° ELBOW, STL, SW	PMO-2652-256	PS	
B		17	1	F24	3/4" PIPE CAP, MALLABLE IRON	S 25-06-138	ST-PS	
B		18	1	F26	3/4"-1/4" REDUCING INSERT, STL	S 25-60-366		
B		19	1	F28	3/4"×1/2"×1/2" TEE, STL, SW	S 25-60-227		

SERVICE - FITTINGS

PS-157
GROUP NO. 2652-0405-1001-PI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 2652-255 SHEET 4 REV. B

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	1 LIN FT	P4	3/4" IPS STD PIPE - STEEL	S 57-06-103	PS	
B		2	50 LIN FT	P5	1/2" IPS STD PIPE - STEEL	S 57-06-102		
B		3	8	H14	1/2" SWING HANGER	S 25-49-326	ST-PS	
		4						
B		5	1	V1	1/2" GLOBE VALVE-BRZ-SCRWD	PO 2652-C7 ①	MD-PS	
B		6	1	V2	↓	↓		
B		7	1	V3	↓	↓		
B		8	1	V4	↓	↓		
B		9	1	V7	1/2" GATE ↓	④		
B		10	1	V8	↓	↓		
B		11	1	V9	↓	↓		
B		12	1	V10	↓	↓		
B		13	1	V13	1/2" SWING CHECK VALVE-BRZ SCRWD	⑥		
B		14	1	V14	↓	↓		
B		15	1	V15	↓	↓		
B		16	1	V16	↓	↓		
		17						
		18						

REMARKS -

SERVICE - PIPES & VALVES

PS-176
GROUP NO. 2652-0405-1002-SI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 2652-255 SHEET 5 REV. B

GROUP

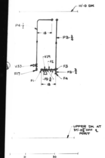
REV.		LINE NO.	QTY (1 SHIP)	FITTING No.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	4	F1	SIZE 150 CONVECTOR	PO 2652-C4 ①	MD-PS	
B		2	4	F2	1/2" THERMOSTATIC TRAP	PO 2652-C5 ①		
B		3	4	F4	1/2" STRAINER	S 26-03-120	ST-PS	
B		4	8	F18	1/2" UNION - STL	S 25-12-194		
B		5	4	F20	1/2"-90° ELBOW - STL, SW	S 25-60-006		
B		6	4	F22	3/4"-1/2", 90° REDUCING ELBOW STL, SW	S 25-60-131		
B		7	4	F23	3/4" TEE, STL, SW	S 25-60-078		
B		8	4	F25	3/4"-1/2" REDUCING INSERT, STL, SW	S 25-60-364		
B		9	4	F27	1/2" SCREWED COUPLING, STL	S 25-07-104		
B		10	30 LIN FT	F29	3"×3"×1/4" ANGLE BAR-STL	S 73-05-238	PS	
B		11	8	F30	1/2" BOLT, L=1 1/4", CAD PL STL	S 21-34-174	ST-PS	
B		12	8	F31	1/2" NUT, ZINC PL STL	S 21-34-210		
B		13	8	F32	1/2 SPRING LOCKWASHER, STL	S 21-45-1485		
B		14	1	F33	THERMOSTAT MOUNTING BRACKET	MAKE FROM AAUSSA MATL S, 60-02-118	PS	
B		15	4	F34	10-24 RH MACH SCR, CAD PL STL	S 23-13-148	ST-PS	
B		16	4	F35	10-24 HEX NUT, CAD PL STL	S 23-31-104		
B		17	4	F36	#10 LOCKWASHER	S 21-45-205E		
B		18	6	F37	1/2" COUPLING, STL, SW	S 25-60-052		
B		19	6	F38	3/4" PIPE CAP, MALLABLE IRON	S 25-06-138		

SERVICE - FITTINGS

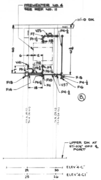
PS-176
GROUP NO. 2652-0405-1002-SI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 2652-255 SHEET 6 REV. B

2652-255

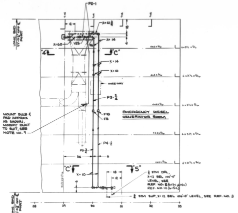
SEPT. '80
FRAME 1
8X


111'-0 DK
P4-½
18
P3-¾
V29
F2
V33
F17
F1
F3
P3-¾
F4
P3-½
18
UPPER DK AT
39'-0⅝" OFF ℄
PORT
31
30

ELEV "5-C"


PREHEATER NO. 4
SEE REF NO. 11
111'-0 DK
V25
F7
P1-1½
F8
P4-½
6
12
V41
F12
P3-½
P3-¾
F9
P6-1½
F13
F14
P6-1½
F10
F11
18
V57
F15
P4-½
F16
P4-½
B1
UPPER DK AT
57'-0¼" OFF ℄
PORT
29
30
ELEV "4-C"
25
26
ELEV "4-C1"

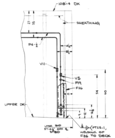
B7 ELEV "4-C" (613C, 614C)
ELEV "4-C1" (615C ONLY)


P2-1
LONG. BHD
57'-0¼" OFF ℄
PORT
12
X=61¾
18
4
X=60
V25
F6
X=14
"4"
"C"
X=14
X=10
WIRE WAY
P3-¾
MOUNT BULB & PAD APPROX AS SHOWN, MODIFY DUCT TO SUIT, SEE NOTE NO. 9
F18
F5
EMERGENCY DIESEL
GENERATOR ROOM
P4-½
P3-¾
36
6
"C"
"5"
X=10
18
12
½ STM DR, X=12 BEL 106'-0" LEVEL, SEE REF. NO. 5 (613C, 614C) REF. NO. 12 (615C)
½ STM SUP, X=12 BEL 106'-0" LEVEL, SEE REF. NO. 3
LONG. BHD
39'-0⅝" OFF ℄
PORT
28
29
30
31
32
33

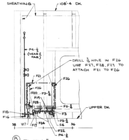
PARTIAL PLAN VIEW - UPPER DECK
UPPER DECK 99'-4" ABV BL AT CL
CAMBER: 52" IN 114'-0" HALF BEAM
NO SHEER
B4 613C, 614C ONLY

108'-4 DK
SHEATHING
12
38

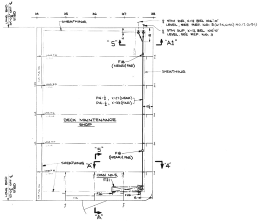
5-A1"


108'-4 DK
SHEATHING
27
33
P4-½
14½
8½
V11
V5
F19
F26
11
54
60
UPPER DK
LONG BHD
57'-0¼" OFF ℄
STBD
½ (PT25.1, WELDING OF F26 TO DECK

SECT "5-A"


SHEATHING
108'-4 DK
P4-½
(NEAR & FAR)
DRILL 9/16 HOLE IN F26 USE F27, F28, F29 TO ATTACH F21 TO F26
F21
F26
F26
F20
P3-¾
F19
F28
P3-½
F15
F16
F3
UPPER DK
38
V17
F17
F24
P3-½
F4
36
F22
P4-½

B7 ELEV "4-A"


LONG. BHD
39'-0⅝" OFF ℄
STBD
34
35
36
37
38
SHEATHING
½ STM DR, X=12 BEL 106'-0" LEVEL, SEE REF. NO. 5 (613C, 614C) NO. 12 (615C)
½ STM SUP, X=12 BEL 106'-0" LEVEL, SEE REF. NO. 3
"5"
"A1"
6
18
F18
(NEAR & FAR)
SHEATHING
P4-½, X=27 (NEAR)
P4-½, X=33 (FAR)
12½
DECK MAINTENANCE
SHOP
"5"
F18
(NEAR & FAR)
SHEATHING
"A"
"4"
CONN NO. 5,
F21
F26
F26
15
LONG. BHD
57'-0¼" OFF ℄
STBD
"A"

PARTIAL PLAN VIEW - UPPER DECK
UPPER DECK 99'-4" ABV BL AT CL
CAMBER: 52" IN 114'-0" HALF BEAM
NO SHEER

REVISIONS			NNS&DD CO		OWNER	
REV	ZONE	DESCRIPTION	DATE	AUTHD	DATE	APPD
A	-	INITIAL ISSUE	—	—	—	—
B	4C	1. ELEV "4C" - ½" SW CK VLV NO. "V-16" CHGD TO "V-57".				
	4A	2. ELEV "4A" - ½" SW CK VLV NO. "V-12" CHGD TO "V-17".				
	5C	3. ELEV "5C" - ½" GATE VLV NO. "V-10" CHGD TO "V-33". ALL TO SUIT DESIGN DEVELOPMENT				
	3C	4. PLAN VIEW - UP DK (P) NOTED FOR 613C & 614C ONLY				
	2A	5. NEW REF # 12 ADDED FOR 615C				
	6C	6. NEW "PLAN VIEW - UP DK (P)" ADDED FOR 615C ONLY				
	4C	7. ELEV 4-C NOTED FOR 613C & 614C AND ELEV 4-C1 ADDED FOR 615C				
	6A	8. ELEV 6-A ADDED FOR 615C ONLY				
	1A	TITLE BLOCK - "52" IN GROUP NO. CHANGED TO "P2".				
	-	"DWG. REV - HULL APPLIC" BLOCK ADDED TO DRAWING MARGIN ABOVE REPRODUCTION BLOCK.	EHR 3-8-78	8W		

AUTHORITY:

GENERAL NOTES:

1. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE U.S.C.G. & A.B.S. SEE REF NO. 2 FOR LIST OF ACCEPTABLE MATERIALS.
2. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS & SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. & REF. NO. 7.
3. PAINTING IS IN ACCORDANCE WITH REF. NO. 9 & 10.
4. TESTS & CLEANING TO BE IN ACCORDANCE WITH REF. NO. 2.
5. PIPE HANGERS TO BE IN ACCORDANCE WITH REF. NO. 8.
6. INSULATION & LAGGING TO BE IN ACCORDANCE WITH REF. NO. 6.
7. CUTS THROUGH NON-TIGHT BHDS TO ALLOW FULL THICKNESS OF INSULATION & SHALL HAVE NEAT FITTING COLLAR PLATES.
8. FLEXIBLE TUBING BETWEEN STEAM CONTROL VALVE (V25) & THERMOSTATIC BULB TO BE LED AS DIRECTLY AS POSSIBLE IN PROTECTED LOCATIONS. WHERE TUBING MAY BE EXPOSED TO MECHANICAL INJURY, #16 USSG SHEET GUARDS SHALL BE PROVIDED.
9. LOCATION OF DUCT TYPE THERMOSTATIC BULB TO BE TEMPLATED FROM WORK & IN NO CASE IS SUCH A BULB TO BE FITTED UNTIL DUCT WORK IN THE VICINITY OF THE HEATER HAS BEEN COMPLETED.
10. CARE IS TO BE TAKEN THAT PIPES, BRACKETS & HANGERS DO NOT INTERFERE WITH THE SPACE REQUIRED FOR REMOVAL OF HEATERS OR CONVECTORS.
11. WHERE PIPING IS SUBJECT TO MECHANICAL INJURY, IT SHALL BE ADEQUATELY PROTECTED.

SEE REF. NO. 4 FOR B/M

B10

DWG. REV - HULL APPLIC						
REV	NN HULLS ONLY					
A	YES	YES	—			
B	YES	YES	YES			

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING YES
REMARKS REV "B"
DATE 3/28/78 SIGNED J. [illegible]

YARD PRINTS
ORDERED BY DESIGN
GROUP:
MC NO.

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
COMMERCIAL DESIGN DEPT.

GROUP 2652-1601-1001-P2 B9

NO.	REFERENCES	DWG NO.
12	PIPING ARRGT CONT. STM DR SYS - ENG RM (615C)	6555-561
11	VENTILATION ARRGT UPPER DK AFT FR 44	2680-585
10	PAINTING SCHEDULE (H615C)	8300-41
9	PAINTING SCHEDULE (H613C-614C)	8300-40
8	STD PIPE HANGERS & INSTALLATION INSTRUCTIONS	257056
7	FAB & WELDING INSTRUCTIONS, CLASS I & II PIPING	257035
6	DIRECTIONS FOR INSUL & LAGGING PIPES	267822
5	PIPING ARRGT CONT. STM DR SYS ENGINE ROOM	6555-469
4	SERVICE STEAM UPPER DK AFT FR 44 - B/M	-258
3	PIPING ARRGT HEATING STEAM SYS ENGINE ROOM	-262
2	SERVICE STEAM DIAGRAM - LIST	-253
1	SERVICE STEAM DIAGRAM - ARRANGEMENT	2652-252

B5

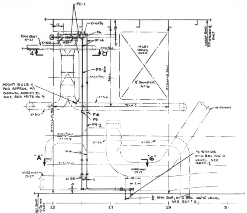
SCALE ½ = 1 FT
DRAWN D.W. McPHAIL
CHECKED DWM
SECT MGR L.R. Schichtenberg
DATE COMPL. 7/27/77
EXAMINED —
AUTHORIZED A. Cowling
DATE 7-28-77
TECH APPROVAL
C S D APPROVAL R.L. Warrington

390,000 DWT TANKER
SERVICE STEAM ARRANGEMENT
UPPER DK AFT FR 44

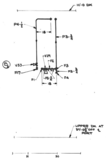
U S M A DESIGN
U S M A DWG NO.
HULL NO.

DWG NO. 2652 - 257
REV B
SHEET NO. 1 OF 1

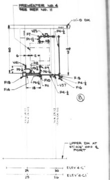
2652 -257
MICRO-MASTER 105 mm
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO
SEPT. '80
FRAME 1
10X


P2-1
X=61¾
EXH VENT X=21
X=60
V25
X=14
INLET OPNG OVER
8" DAMPER A=16
P3-¾
MOUNT BULB & PAD APPROX. AS SHOWN, MODIFY TO SUIT, SEE NOTE No. 5
X=56
F18
F5
P4-½
WIREWAY
"A"
"6"
WIREWAY D-27
WIREWAY D=17
½ STM DR X=12 BEL 106'-0 LEVEL, SEE REF # 2
½ STM SUP, X=12 BEL 106'-0" LEVEL SEE REF # 3
25
27
29
31

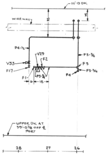
PARTIAL PLAN VIEW - UPPER DECK
UPPER DECK 99'-4" ABV BL AT CL
CAMBER: 32" IN 114'-0" HALF BEAM
NO SHEER
(B) 615C ONLY


111'-0 DK
P4-½
P3-¾
V29
F2
F3
V33
F17
F1
F4
(B)
UPPER DK AT 39'-0⅝" OFF ℄ PORT
31
30

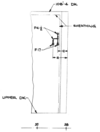
ELEV "5-C"


PREHEATER NO. 4 SEE REF NO. 11
111'-0 DK
V25
F7
P4-½
V41
F12
F13
F14
F10
V37
F16
F11
F15
(B)
UPPER DK AT 57'-0⅛" OFF ℄ PORT
29
30
25
26
ELEV 4-C
ELEV 4-C1

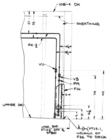
(B) ELEV "4-C" (613C, 614C)
ELEV "4-C1" (615C ONLY)


111'-0 DK
WIREWAY
P4-½
V29
F2
V33
F17
F1
P3-¾
F3
F4
UPPER DK AT 39'-0⅝ OFF ℄ PORT
28
27
26

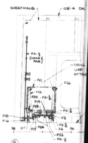
(B) ELEV "6-A"
(615C ONLY)


108'-4 DK
P4-½
SHEATHING
F17
UPPER DK
37
38

ELEV "5-A1"


108'-4 DK
SHEATHING
P4-½
V11
V5
F19
F26
UPPER DK
LONG BHD 57'-0⅛" OFF ℄ STBD
PT25-1, WELDING OF F26 TO DECK

SECT "5-A"


SHEATHING
108'-4 DK
P4-½ (NEAR & FAR)
DRILL
USE
ATTA
F21
F26
F16
F20
F19
F28
P3-¾
F18
F3
F4
F22
V17
F17
F14
38
36

(B) ELEV "4-A"

2652 -257

SEPT. '80
FRAME 2
10X

2652-258

CSD VAULT

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS REV. "B"
GROUPING YES
DATE 3/8/78

YARD PRINTS

ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS					
REV.	1	2	3	4	5
SHEET	B	B	B	B	B

GROUP

MC NO.

615C	311
614C	310
613C	309
NNS&DDCo. HULL No.	MARAD HULL No.

USNA DESIGN

SHIP'S NAME

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
	NN HULLS ONLY		
A	YES	YES	—
B	YES	YES	YES

APPROVALS

OWNERS

ABS

USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689

DESIGN DIVISION DEPT. COMMERCIAL DESIGN

GROUPED BY CHK.
DATES PART COMP.
HULL GROUP NO KEY
TYPE OF DWG.

SCALE — =1 Ft.
DRAWN D.W. McPHAIL
CHECKED DWM
SECT. MGR. V.R. Schellenberg
DATE COMPL. 7/27/77
EXAMINED —
AUTHORIZED A. Conley
DATE 7-28-77
TECH. APPROVAL
CSD APPROVAL R. L. Harrington

TITLE 390,000 D.W.T. TANKER
SERVICE STEAM - UP DK AFT FR 44
BILL OF MATERIAL

DWG. NO. 2652 - 258 REV B SHEET NO. 1 OF 5

MB 8½ X 14

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APPD.
A	—	INITIAL ISSUE	—	—	—	—
B	1	TITLE BLOCK UNDER "HULL APPLICABILITY" HULL "615C" ADDED. "615C" AND "311" ADDED TO "SHIP'S NAME" BLOCK.				
	4	LINE 14 - VLV NO. "V-16" CHGD TO "V-37". LINE 15 - VLV NO. "V-10" CHGD TO "V-33". LINE 18 - VLV NO. "V-12" CHGD TO "V-17". ALL TO SUIT REF NO. 1.	3-8-78			
	3,4,5	BOTTOM OF EACH SHEET UNDER "APPLICABLE HULLS" APPLICABILITY EXTENDED TO 615C. UNDER "GROUP NO.", "SI" CHANGED TO "PI".				
	5	LINE 3 - "QTY (1SHIP)" INCREASED FROM "27" TO "30" LIN. FT. FOR ITEM P3. LINE 4 - "QTY (1SHIP)" INCREASED FROM "86" TO "89" LIN. FT. FOR ITEM P4.		JRL		

NO.	REFERENCES	DWG. NO.
1	SERVICE STEAM - UPPER DK AFT FR 44 - ARRANGEMENT	2652-257

HULL NO. 613C, 614C
DWG. NO. 2652-258
SHEET 2 OF 5

MN46 8½ X 14

GROUP

REV.	LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A		1	F1	$\frac{3}{4}$" - 90° ELBOW, STL, SW	S 25-60-007	ST-PS	
		1	F2	$\frac{3}{4}$" - STRAINER	S 26-03-122		
		2	F3	$\frac{3}{4}$" - TEE, STL, SW	S 25-60-078		
		2	F4	$\frac{3}{4}$" PIPE CAP, MALLABLE IRON	S 25-06-138		
		1	F5	$\frac{3}{4}$" COUPLING, STL, SW	S 25-60-058		
		1	F6	1" - $\frac{3}{4}$" - 90° REDUCING ELBOW STL, SW	S 97-16-008		
		1	F7	$1\frac{1}{2}$" - 1" - 90° REDUCING ELBOW STL, SW	S 97-16-005		
		1	F8	$1\frac{1}{2}$" UNION, STL	S 25-12-202		
		1	F9	$1\frac{1}{4}$" UNION, STL	S 25-12-200		
		1	F10	$1\frac{1}{4}$" x $1\frac{1}{4}$" x $\frac{3}{4}$" - TEE, STL, SW	S 25-60-250		
		1	F11	$1\frac{1}{4}$" PIPE CAP-MALLABLE IRON	S 25-06-142		
		1	F12	$\frac{3}{4}$" x $\frac{3}{4}$" x $\frac{1}{4}$" - TEE, STL, SW	S 25-60-226		
		1	F13	COMB FLOAT & THERMOSTATIC TRAP	P.O. 2652 C3 ②	MD-PS	
		1	F14	$\frac{3}{4}$" x $\frac{1}{2}$" REDUCING BUSHING, STL, THREADED	S 25-05-218	ST-PS	
		2	F15	$\frac{1}{2}$" - TEE, STL, SW	S 25-60-077		
		2	F16	$\frac{1}{2}$" PIPE CAP - MALLABLE IRON	S 25-06-136		
		4	F17	$\frac{1}{2}$" - 90° ELBOW, STL, SW	S 25-60-006		
		5	F18	$\frac{1}{2}$" - COUPLING, STL, SW	S 25-60-052		

REMARKS:

SERVICE: FITTINGS
GROUP NO. 2652-1601-1001-PI
APPLICABLE HULLS 613C 614C 615C
DWG. NO. 2652-258 SHEET 3 REV. B

GROUP

REV.	LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	2	F19	$\frac{1}{2}$" UNION	S 25-12-194	ST-PS	
	2	1	F20	$\frac{3}{4}$" x $\frac{1}{2}$" - 90° REDUCING ELBOW STL, SW	S 97-16-002		
	3	1	F21	SIZE 150 CONVECTOR NO. 5	P.O. 2652-C4 ②	MD-PS	
	4	1	F22	$\frac{3}{4}$" x $\frac{1}{2}$" REDUCING INSERT, STL, SW	S 25-60-364	ST-PS	
	5	1	F23	$\frac{1}{2}$" STRAINER	S 26-03-120		
	6	1	F24	$\frac{1}{2}$" SCREWED COUPLING, STL	S 25-07-104		
	7	1	F25	$\frac{1}{2}$" THERMOSTATIC TRAP	P.O. 2652-C5 ②	MD-PS	
	8	8 LIN FT	F26	3" x 3" x $\frac{1}{4}$" ANLGE BAR - STL	S 73-05-238	ST-PS	
	9	2	F27	$\frac{1}{2}$" BOLT, L = $1\frac{1}{4}$, CAD PL STL	S 97-60-650		
	10	2	F28	$\frac{1}{2}$" NUT, ZINC PL STL	S 21-34 210		
	11	1	V29	$\frac{3}{4}$" GLOBE VLV, BRZ, SCRWD 200#	P.O. 2652-C7 ②	MD PS	
	12	1	V25	1" STM CONTROL VLV, SCRWD	P.O. 2652-C1 ①		
	13	1	V41	$\frac{1}{4}$" PET COCK, BRZ, SCRWD 125#	S 97-15-030	ST-PS	
	14	1	V37	$\frac{1}{2}$" SWING CHK VLV, BRZ, SCRWD 200#	P.O. 2652-C7 ⑥	MD PS	
	15	1	V33	$\frac{1}{2}$" GATE VLV, BRZ, SCRWD 200#	P.O. 2652-C7 ④		
	16	1	V5	$\frac{1}{2}$" GLOBE VLV, BRZ, SCRWD 200#	P.O. 2652-C7 ①		
	17	1	V11	$\frac{1}{2}$" GATE VLV, BRZ, SCRWD 200#	P.O. 2652-C7 ④		
	18	1	V17	$\frac{1}{2}$" SWING CHK VLV, BRZ, SCRWD 200#	P.O. 2652-C7 ⑥		

REMARKS:

SERVICE: FITTINGS & VALVES
GROUP NO. 2652-1601-1001-PI
APPLICABLE HULLS 613C 614C 615C
DWG. NO. 2652-258 SHEET 4 REV. B

GROUP

REV.	LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1 LIN FT	P1	$1\frac{1}{2}$" IPS STANDARD PIPE, STL	S 57-06-106	PS	
	2	2 LIN FT	P2	1"	S 57-06-104		
B	3	30 LIN FT	P3	$\frac{3}{4}$"	S 57-06-103		
B	4	89 LIN FT	P4	$\frac{1}{2}$"	S 57-06-102		
A	5	2 LIN FT	P5	$\frac{1}{4}$"	S 57-06-100		
	6	2 LIN FT	P6	$1\frac{1}{4}$"	S 57-06-105		
	7						
A	8	1	H-12	$\frac{1}{4}$" SWING HANGER	S 25-47-304	ST-PS	
	9	21	H-12	$\frac{1}{2}$"	S 25-47-326		
	10	8	H-12	$\frac{3}{4}$"	S 25-47-336		
	11	1	H-12	1"	S 25-47-346		
	12						
A	13	2	F29	$\frac{1}{2}$" SPRING LOCKWASHER, STL	S 21-45-148	ST-PS	
	14						
	15						
	16						
	17						
	18						

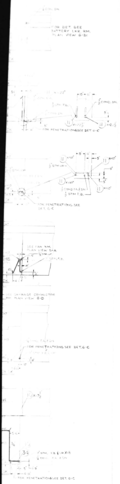
REMARKS:

SERVICE: PIPES, HANGERS, FITTINGS
GROUP NO. 2652-1601-1001-PI
APPLICABLE HULLS 613C 614C 615C
DWG. NO. 2652-258 SHEET 5 REV. B

2652-258

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80
FRAME
8X


½ COND. DN.
FOR DET. SEE BATTERY LKR. RM. PLAN VIEW 6-D1
11 X=22"
½ STM. F.B.
½ COND. DN.
11 X=22½
11 X=22½
5"
FOR PENETRATIONS SEE DET. 6-C
11 X=10"
½ STM. UP
½ COND. FA & DN.
½ STM. F.B.
FOR PENETRATIONS SEE DET. 6-C
SEE FAN RM. PLAN VIEW 5-A
½ STM. UP
STM. F.B.
SEE GARBAGE COMPACTOR RM. PLAN VIEW 5-D
FOR PENETRATIONS SEE DET. 6-C
10 X=7½
34
FOR PENETRATIONS SEE DET. 6-C

LIST OF MATERIAL

REV.	ITEM NO.	PART NO.	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
				PIPE LIST			
	P1	PL-102-3	½"	PIPE CARBON STL. (BLK.)	SCH. 40	ASTM-A-53 GRADE "B" E, F or S	
	P2	-4	¾"	↓	↓	↓	
	P3	-5	1"	↓	↓	↓	
	P4	-6	1¼"	↓	↓	↓	
	P5	-7	1½"	↓	↓	↓	
	P6	-8	2"	↓	↓	↓	
	P7	PL-102-10	3"	PIPE CARBON STL. (BLK)	SCH. 40	↓	
				FITTING LIST			
	1	PL-067-01		STEAM CONVECTOR	THERMO-TROL CORP.		
	2	-092-02	¼"	PACKING ¼" DIA. ROPE	ASBESTOS ROPE COMM'L.		SEE DET. G-C
	3	-092-01		INSULATING RING	COMPRESSED ASBESTOS COMM'L		↓
	7	-400-8	1½"	EL. 90° SCREWED M.I.	ASTM-A-47	ANSI-B-16.3 150#	ITT GRINNELL FIG. 1101 OR EQUAL
	8	-7	1¼"	↓	↓	↓	↓
	9	-6	1"	↓	↓	↓	↓
	10	-5	¾"	↓	↓	↓	↓
	11	-4	½"	↓	↓	↓	↓
	12	-404-08	1½"	ELBOW 45° SCREWED	↓	↓	ITT GRINNELL FIG. 1102 OR EQUAL
	13	-404-04	½"	ELBOW 45° SCREWED	↓	↓	ITT GRINNELL FIG. 1102 OR EQUAL
	14	-416-16	1¼" × ½"	REDUCER SCREWED M.I.	ASTM-A-47	ANSI-B-16.3 150#	ITT GRINNELL FIG. 1125 OR EQUAL
	15	-22	1½" × 1¼"	↓	↓	↓	↓
	16	-23	2" × ½"	↓	↓	↓	↓
	18	-416-10	¾" × ½"	↓	↓	↓	↓
	19	-27	2" × 1½"	↓	↓	↓	↓
	20	-18	1¼" × 1"	↓	↓	↓	↓
	23	-406-7	1¼"	TEE SCREWED M.I.	ASTM-A-47	ANSI-B-16.3 150#	ITT GRINNELL FIG. 1105 OR EQUAL
	24	-4	½"	↓	↓	↓	↓
	25	-406-9	2"	TEE	↓	↓	↓
	26	-409-7	2" × 1¼" × 1¼"	REDUCING SCR.	↓	↓	↓
	27	-409-18	2" × 2" × 1"	TEE REDUCING SCR. M.I.	ASTM-A-47	ANSI-B-16.3 150#	ITT GRINNELL FIG. 1105R OR EQUAL
	28	-408-14	1¼" × 1¼" × ½"	↓	↓	↓	↓
	29	-408-16	1¼" × 1¼" × 1"	↓	↓	↓	↓
	30	-407-43	1" × 1" × ¾"	↓	↓	↓	↓
	31	-407-27	¾" × ¾" × ¼"	↓	↓	↓	↓
	32	-408-10	1¼" × 1" × 1"	↓	↓	↓	↓
	33	-407-30	1" × ¼" × 1"	↓	↓	↓	↓
	34	-409-17	2" × 2" × ¾"	↓	↓	↓	↓
	36	-051-05	2"	FLANGE SLIP-ON FLAT FACE FORGED STL.	ASTM-A-105	ANSI-B-16.5 150#	VOGT SERIES NO. SF-7182 OR EQUAL
	38	-051-06	2"	FLANGE THREADED FLAT FACE FORGED STL.	ASTM-A-105	ANSI-B-16.5 150#	VOGT SERIES NO F-7182 OR EQUAL
	40	-029-01	¼"	STL. PIPE NIPPLE 150# SCH. 40	ASTM-A53 GR. B	TYPE E, F OR S	ITT GRINNELL FIG 339 OR EQUAL
	41	-431-8	1½"	UNION SCREWED M.I.	ASTM-A-197	ANSI-B-16.3 150#	ITT GRINNELL FIG. 463 OR EQUAL
	42	-6	1"	↓	↓	↓	↓
	43	-5	¾"	↓	↓	↓	↓
	44	-7	1¼"	↓	↓	↓	↓
	46	-415-9	2"	COUPLING SCREWED M.I.	ASTM-A-47	ANSI-B-16.3 150#	ITT GRINNELL FIG. 1121 OR EQUAL
	47	-421-4	½"	CAP ↓	↓	↓	↓
	48	-7	1¼"	CAP SCREWED M.I.	ASTM-A-47	ANSI-B-16.3 150#	ITT GRINNELL FIG. 1124 OR EQUAL
	49	-6	1"	↓	↓	↓	↓
	50	-070-14	¼"	STOP COCK VALVE 200#			ITT GRINNELL FIG. 830 OR EQUAL
	51	-15	1¼"	GLOBE VALVE			FIG. 3240
	52	-16	1"	↓			↓
	53	-17	¾"	↓			↓
	54	-12	½"	GATE VALVE			FIG 3070
	55	-13	1"	↓			↓
	56	-072-02	1"	STRAINER			WALWORTH "Y" TYPE NO. 3699½
	57	-072-03	1¼"	↓			↓
	58	-074-02	1½"	TEMPERATURE REGULATOR			ROBERTSHAW CONT. CO. MODEL NO. G-32L
	59	-01	1¼"	↓			MODEL NO. E-3L
	60	-070-18	½"	GLOBE VALVE			ITT GRINNELL FIG. 3240 OR EQUAL
	61	-073-1	1"	FLOAT-THERM. STEAM TRAPS			SARCO TYPE FT-75
	62	-073-2	¾"	↓			↓
	63	-073-3	½"	THERMOSTATIC STM TRAP			9B-225
	64	-064-09	⅝"	WASHER - SPRING LOCK	ASTM-A307	ANSI-B16.2.1	
	65	-07	⅝"-11	HEX NUT	ASTM-A-307	ANSI-B-16.2.1	
	66	-05	⅝"-11 × 2¾"	BOLT	↓	↓	
	67	-037-02	2" ⌀	GASKET FOR 2" ⌀ FLANGE	ASBESTOS		COMMERCIAL 1/16 TK.
	68	-149-30	3"	DECK SLEEVE STL. SCH. 80	ASTM-A53 SEAMLESS DRAWN		SEE DET. G-C FROM STOCK
	69	-421-11	3"	CAP SCREWED M.I.	ASTM-A47	ANSI-B16.3 150#	↓
	70	-070-34	½"	WYE STRAINER W/BLOW OFF PLUG	ASTM B61, B62 #250		WALWORTH 3699½
	71	062-14	1¼	ADAPTER 1¼ I.P.S. c 1.60" O.D. x FPT	BRONZE		FLAG FLOW 5063 OR EQ
	72	062-15	1½	ADAPTER 1½ I.P.S. c 1.90" O.D. x FPT	BRONZE		FLAG FLOW 5063 OR EQ
	73	489-05	¾	PLUG SCREWED 150# M.I.	ASTM-A-197	ANSI B16.4	ITT GRINNELL FIG 387 OR EQ
	74	432-10	¾ × ½	BUSHING HEX. SCREWED M.I. 150#	ASTM-A-197	ANSI B16.4	FLAG 2071 OR EQUAL
	75	431-04	½"	UNION FEMALE 150# M.I.	ASTM-A-153	ANSI B2.1	ITT GRINNELL FIG 463 OR EQ

REVISIONS

REV	ZONE	DESCRIPTION	N.N.S.&D.D.CO. DATE	N.N.S.&D.D.CO. AUTHD	OWNER DATE	OWNER APPD
O		SUBMITTAL FOR APPROVAL	6-17-77	RLH	7-29-77 8-22-77	SHELL [illegible]
A		-INITIAL ISSUE- 1) ½" STEAM & ½" COND ON "A" DK OVERHEAD REVISED TO RUN FORWARD TO FR H 15. 2) DETAILS 5-A / 5-C REVISED TO AGREE WITH REV. 1. 3) "C" DK PLAN VIEW 54½" DIM WAS 50½". 4) "D" DK PLAN VIEW 3" DIM WAS 5½". 5) ADDED (2) ITEM Nº 11 TO PARTS LIST. 6) PLAN VIEW UPPER DK REVISED TO AGREE WITH UNDER CAMBER DK COMPOSITE. 7) LOCATION ¾" STEAM TO GARBAGE COMPACTOR RM REVISED-MOVED AFT. 8) DETAIL 5-D / SECTION 5-D1 REVISED. 9) REVISED PL# ITEMS 1, 2, 67.	1-13-78	RLH		
B		1. PLAN VIEW 5-A REV. 2. SECTION 7-A REV. TO AGREE WITH REV. 1. 3. ITEMS 12 & 13 ADDED 11-4-77 R.W.M. 4. REV ITEM 50 THRU 55 TO 200# 5. ADDED ITEM 70 TO SECT 6-D & L/M 1-23-78	2-14-78	RLH		
C		1. ADDED ITEM 20, 23, 71, 72 TO PLAN & ITEM 71, 72, TO L/M. 2. ADDED ITEM 73, 74, 75 TO L/M & SECT 6-D & DELETED ITEM 43 3. ADDED ITEM 54 & 75 TO BTRY LKR SUPPLY AT FAN RM.				

AUTHORITY:

GENERAL NOTES:

1. - CONDENSATE PIPING SHALL BE DESIGNED FOR GRAVITY RETURN.
2. - CUT THRU NON TIGHT BULKHEADS, TRANSVERSES & LONGITUDINALS TO ALLOW FULL THICKNESS OF INSULATION OF PIPES UNLESS OTHERWISE NOTED ON PLAN.
3. - ALL PIPING SHALL BE SUITABLY PITCHED TO FACILITATE DRAINAGE. POCKET TO BE AVOIDED AS MUCH AS POSSIBLE. DRIPS SHALL BE PROVIDED AT ALL LOW POINTS, PROPERLY TRAPPED.
4. - EACH PIECE OF HEATING EQUIPMENT SHALL BE PROVIDED WITH A CUTOUT VALVE IN THE STEAM SUPPLY LINE AT THE UNIT.
5. - PROVIDE MINIMUM 24" BARE PIPE & FITTING BETWEEN HEATER (CONDENSATE) & TRAP.
6. - INSULATION & LAGGING REQUIREMENTS SHALL BE IN ACCORDANCE WITH REF. #4
7. - VALVE MARKED THUS ⊥ ON FACE OF PLAN SHALL BE INSTALLED AS FOLLOW:

FLUID ON THIS SIDE IS ISOLATED FROM THE STEM PACKING WITH THE VALVE CLOSED.

FLUID ON THIS SIDE IS IN CONTACT WITH THE STEM PACKING WITH THE VALVE CLOSED.

NO.	REFERENCES	DWG NO.
4	TYPICAL PIPING INSTALL. DETS & GEN. NOTES	2502-140
3	VENT. ARRGT. FAN RM ARRGT. & DETS.	2680-601
2	SERVICE STEAM DIAGRAM ARRANGEMENT	2652-252
1	SERVICE STEAM DIAGRAM LIST	2652-253

NNS & DD CO HULL NO.	MARAD HULL NO.
615	311
614	310
613	309

SHIPS NAME

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS
OWNERS [illegible] SHELL LTR [illegible] DTD 7-29-77 GK SUMNER
ABS APPL. LTR. [illegible] DATED 6-15-77 H.J. ECKARIUS
NEWPORT NEWS LTR. DTD 10-17-77 RL HARRINGTON
USCG N.R.

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689 DEPT

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

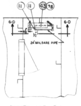
SCALE ¾ & 3/32 - 1 FT
DRAWN A.H.
CHECKED R.H. Salmonen
SECT MGR J. F. Coggins
DATE COMPL. 4-15-77
EXAMINED —
AUTHORIZED A. Conley
DATE 1-24-78
TECH APPROVAL
C S D APPROVAL R.L. Harrington

SVC. STEAM SYS. ARRGT.
CAMBER DK. & ABOVE

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO 613, 614, 615
DWG NO. 2652-260
REV C3
SHEET NO. 1 OF 1

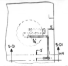
REPRODUCTION OFFICE
YARD PRINTS
REMARKS
DATE
SIGNED
DEPT.
YARD PRINTS
ORDERED BY DESIGN
GROUP:
MC NO.

2652-260
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 1
10X

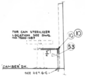


11
11
43
75
6-D
6-D
1½"
24" MIN. BARE PIPE

BATTERY LKR. RM.
PLAN VIEW 6-D1
SCALE: 3/4" = 1'-0"

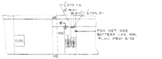


GARBAGE COMPACTOR RM.
PLAN VIEW 5-D
SCALE: 3/4" = 1'-0"



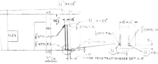
FOR CAN STERILIZER LOCATION SEE DWG. NO. 7000-387
10
10
53
"CAMBER" DK.
SEE DET. 6-C

SECTION 5-D1



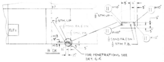
½" STM. F.B.
15"
11"
½" CON. DN.
H7
8"
H10
ELEV
UP
FOR DET. SEE BATTERY LKR. RM. PLAN VIEW 6-D1
H15

"D" DK



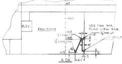
11 X=22"
H7
54½"
15"
11 X=22"
½" CON. F.A.
H10
ELEV
½" STM. UP
½" STM. F.B.
½" COND. DN.
15" 11"
½" STM. F.B.
½" COND. DN.
5"
H15
5"
11 X=22½"
11 X=22½"
11"
FOR PENETRATIONS SEE DET. 6-C

9½" DK



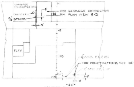
H7
5" 11"
11 X=10"
11 X=10"
5"
½" STM. UP
½" STM. UP
½" COND. F.A. & DN
½" STM. F.B.
ELEV
H13
9"
H15
11 X=10"
11 X=10"
½" COND. F.A. & DN
½" STM. F.B.
5"
5"
11"
15"
FOR PENETRATIONS SEE DET. 6-C

B DK



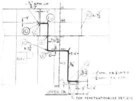
H7
H10
ELEV
FAN ROOM
SEE FAN RM. PLAN VIEW 5-A
H13
½" COND. F.A.
½" STM. UP
H15
1¼" COND. DN.
2" STM. F.B.
10
10"
H19
5
4'-11"

A DK



GARBAGE COMPACTOR RM.
CAN STER.
¾" STM. F.B.
H1
H4
SEE GARBAGE COMPACTOR RM. PLAN VIEW 5-D
5"
H7
ELEV.
H13
1¼" COND. F.A. & DN
FOR PENETRATIONS SEE DET. 6-C
2" STM. F.B. & UP
H19
10"
1'-8"
8"
4'-11"

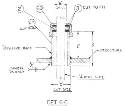
CAMBER DK



¾" STM. UP X=7"
H1
5"
10
10 X=7½"
8"
H4
10
C
C
H7
7'-6¾"
10 X=7¼"
C
H10
6
5'-6"
ELEV.
H13
¾"
10
34
2" STM. F.B. & UP X=8
1¼" COND. F.A. & DN
H19
5"
1'-9"
4'-11"
FOR PENETRATIONS SEE DET. 6-C

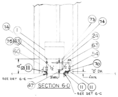
UPPER DK

"A"	"B"	"C"	"D"
1¼"	1⅞"	3⅝"	3" ⌀ NOM.
2"	2⅝"		
½"	1⅟16"		
¾"	1¼"		



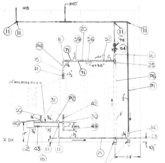
2
69
"B" DRILL
3 CUT TO FIT
F7 CUT TO FIT
"D" SLEEVE SIZE
2"
3"
STRUCTURE
3/16"
CAMBER DK. ONLY
"A" PIPE SIZE
"C"
CUT SIZE

DET. 6-C
N.T.S.



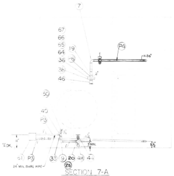
74
73
74
1
24
75
43
63
60
54
70
12
11
3 MIN.
"D" DK
SEE DET. 6-C
47
11
11
4 MIN.
SEE DET. 6-C

SECTION 6-D



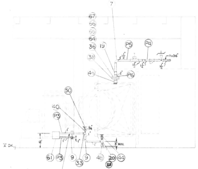
X=10"
H15
11
11
11
11
20
P4
8
59
56
52
75
64
71
16
15
1¼"
71
X=36"
25
41
1½"
P6
24" MIN. BARE PIPE
P1
31
P2
50
42
40
30
3 MIN.
49
"A" DK
14
23
62
43
11
11
P1
5½
1'-9"
16
SEE DET. 6-C

SECTION 5-C
SCALE: 3/4" = 1'-0"



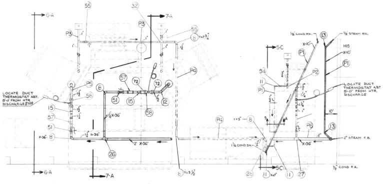
7
67
66
65
19
64
36
38
46
P4
X=36"
50
40
P3
"A" DK.
3 MIN.
51
P3
33
9
20
48
44
23
24" MIN. BARE PIPE

SECTION 7-A
SCALE: 3/4" = 1'-0"



7
67
66
65
64
36
19
38
P5
P4
X=36"
41
P6
50
40
P3
"A" DK.
3 MIN.
61
P3
9
9
33
48
20
23
44
24" MIN. BARE PIPE

SECTION 6-A
SCALE: 3/4" = 1'-0"



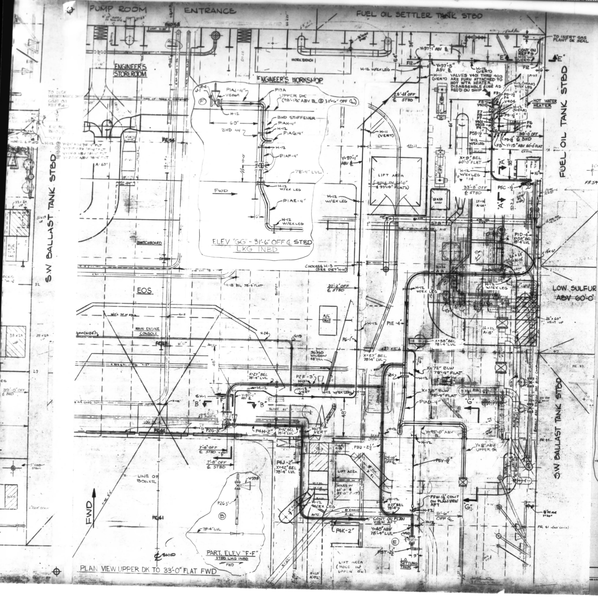
6-A
55
32
P3
7-A
55
Y=7¾"
P3
P4
LOCATE DUCT THERMOSTAT ABT. 5'-0" FROM HTR. DISCHARGE (TYP)
15
57
51
X=36"
8
P5
58
57
72
72
51
15
12
58
1½" X=36"
X=36"
2" X=36"
26
6-A
7-A
Y=5½"
½" COND. R.A.
13
½" STEAM R.A.
X=10"
H15
5-C
P1
X=10"
P1
34
P2
P1
LOCATE DUCT THERMOSTAT ABT. 5'-0" FROM HTR. DISCHARGE
10"
P4
Y=3"
8
P6
1¼" COND. DN.
13
X=36"
2" STEAM F.B.
5-C
28
11
11
27
½" COND. R.A.

FAN ROOM PLAN VIEW 5-A
SCALE: 3/4" = 1'-0"

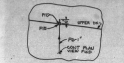
SECTION 5-A

2652-260

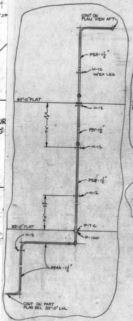
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 2
10X


PUMP ROOM
ENTRANCE
FUEL OIL SETTLER TANK STBD
ENGINEER'S STOREROOM
ENGINEER'S WORKSHOP
S.W. BALLAST TANK STBD
FUEL OIL TANK STBD
LIFT AREA
SWITCHBOARD
EOS
MAIN ENGINE CONSOLE
A/C UNIT
LOW SULFUR ABV 60'-0"
S.W. BALLAST TANK STBD
HOT WATER HEATER
TO INERT GAS PLANT DK SEAL
VALVES V401 THRU 403 ARE FURN ATTACHED TO HOT WTR HEATER. DISASSEMBLE & USE AS REQ'D ON SHIP
LINE OF BOILER
FWD
L.O. SETTLING TANK
DETAIL "H-H"
ELEV "GG" - 31'-6" OFF ℄ STBD
LKG INBD
PART ELEV "F-F"
STBD LKG INBD
FWD

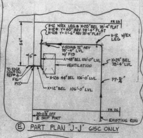
PLAN VIEW UPPER DK TO 33'-0" FLAT FWD


P17
F15
UPPER DK
P6-1"
CONT PLAN VIEW FWD

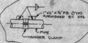
SECTION VIEW "E-E"
LKG FWD


CONT ON PLAN VIEW AFT
P5X-1½"
H-12 W/EX LEG
60'-0" FLAT
H-12
P5Y-1½"
H-12
P5Z-1½"
H-12
33'-0" FLAT
P17C
H-13
F-100
P5AA-1½"
CONT ON PART PLAN BEL 33'-0" LVL

SECTION VIEW "D-D"
LKG FWD


H-12 W/EX LEG & X=20" BEL 78'-4" FLAT
H-12 Ⓔ Y=60" ABV 78'-4" FLAT
H-12B Y=11'-6" ABV 78'-4" FLAT
H-12 W/EX LEG
V-5069 Y=72" ABV 78'-4" LVL
X=48" BEL 106'-0" LVL
VENTILATION
X=24" BEL 78'-4" LVL
H-12B 44" BEL 106'-0" LVL
P7-¾"
X=12" BEL 106'-0" LVL
30'-0" OFF ℄ SHIP PORT
FR 26
EXISTING RUN

Ⓔ PART PLAN "J-J" 615C ONLY


1"×2"×¼" FB (TYP) FURNISHED BY X42
PIPE
HANGER CLAMP

DETAIL "H-H"
TYPICAL CONNECTION OF F.B. CHOCKS TO PIPE

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHD	OWNER DATE	OWNER APPD
A	ALL	INITIAL ISSUE	9/2/76		—	—
B	-	PIPES P5V-1½ & P5W-1½ ALT TO SUIT RELOCATED LADDER ON 60'-0" FLAT	9/2/77		—	—
C	—	ADDED PIPE P1AD, P1AE, P1AF, P1AG, P1AH, P1AJ & V-5069.	8/18/77		—	—
D	—	ADDED SPECIAL HGRS	12/12/77		—	—
E	—	ADDED PART PLAN "J-J" (HG15) ALT'D P3T-2½" TO SUIT STRUCTURAL CHANGE OF L.O. STORAGE & SETTLING TANKS	5/17/78		—	—
F	—	BLANK FLANGE J-1 ADDED TO SHORE CONNECTION VALVE V-5063. (WORK ACCOMP ON 613C)	10/7/78		—	—

~~AUTHORITY:~~

GENERAL NOTES:

[redacted]

13. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOW: BUTT WELDS TYPE P-3, SOCKET WELDS TYPE P-14, AND FLANGE WELDS TYPE P-16A ON REFERENCE 3 EXCEPT AS OTHRWISE INDICATED.

14. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.

15. ALL HOLECUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.

16. HANGERS (SH-1, FOR EXAMPLE) AND TIE RODS (SUCH AS TR-1) INDICATED ON PLAN ARE TO BE INSTALLED WITHIN 6" OF POSITION SHOWN ON REF # 12.

REVISION APPLICABILITY

REV	N.N. HULL NO. 613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	YES
E	YES	YES	YES
F	YES	YES	NO

REPRODUCTION OFFICE

YARD PRINTS YES

REMARKS

DATE 12-7

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C 614C 613C	311 310 309	

APPROVALS

OWNERS

ABS

USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

NO.	REFERENCES	DWG NO.
13	PP ARR - OIL/WTR SEP-BILGE SYS & BALL WTR SAMPLE-E.R.-PL, SEC, EL	2280-715
12		
11	PP ARR L.O. FILL & PURIF SYS - PLAN, SECT, ELEV	6200-623
10	PP ARR 220 PSI CONTAM ST SYS ER-PLAN, SECT, ELEV	6450-703
9	ARR SERV ST SYS CAMBER DECK & ABOVE	2652-260
8	PIPING ARR MN LO SUMP	6200-626
7	SERV ST SYS ARR STEER GEAR FLAT	2652-254
6	PAINTING SCHEDULE	8300-498
5	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
4	SERV ST SYS ARR UPPER DK AFT FR 44	2652-257
3	FABRICATION & WELDING INSTRUCTIONS - CL I & II PIPING	257035
2	ARR	6450-692
1	DIAGRAM - CONTAMINATED ST GENERATING SYS - LIST	6450-653

● HULLS 613C & 614C
△ HULL 615 ONLY

SCALE ½" = 1 FT
DRAWN E. R. SMOOT
CHECKED T.E. SEAMAN
SECT MGR J. N. Johnson
DATE COMPL. 9-2-76
EXAMINED
AUTHORIZED I. T. Stephens
DATE 9-2-76
TECH APPROVAL NOT REQ'D
C S D APPROVAL R. Harrington

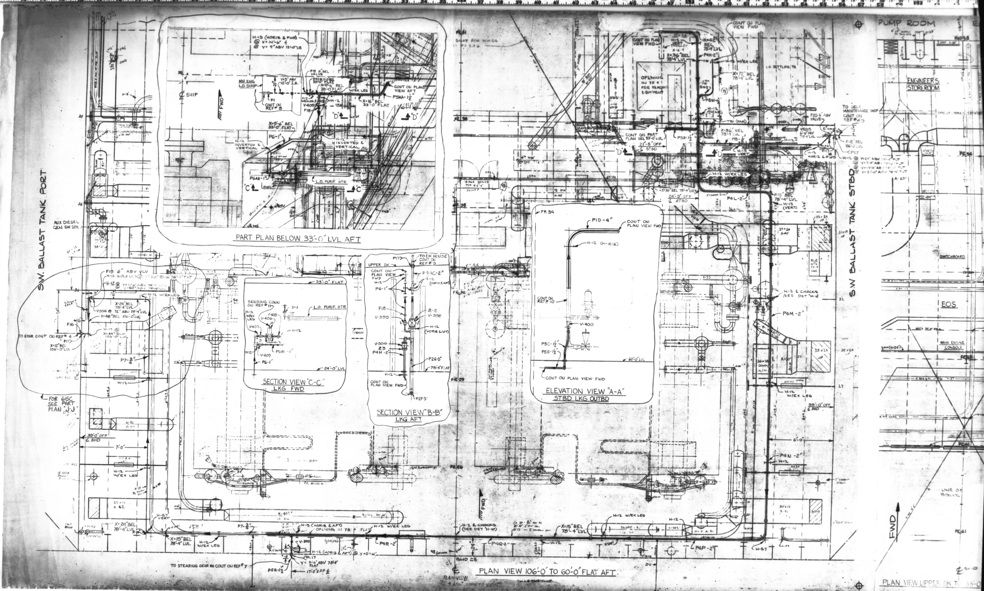
PIPING ARR HEATING STEAM SYS E.R. - PLAN, SECT, ELEV

U S M A DESIGN TII-S-116a
U S M A DWG NO.
HULL NO.
DWG NO. 2652-262
REV F
SHEET NO. 1 OF 1

2652 -262

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 1
10X


PART PLAN BELOW 33'-0" LVL AFT
SECTION VIEW "C-C"
LKG FWD
SECTION VIEW "B-B"
LKG AFT
ELEVATION VIEW "A-A"
STBD LKG OUTBD
PLAN VIEW 106'-0" TO 60'-0" FLAT AFT
PLAN VIEW UPPER DK TO 33'-0
S.W. BALLAST TANK PORT
S.W BALLAST TANK STBD
PUMP ROOM
ENGINEER'S STOREROOM
SWITCHBOARD
EOS
MAIN ENGINE CONSOLE
LINE OF BOILER
AUX DIESEL GEN SW STR
L.O. PURIF. HTR
MN ENG L.O. SUMP
SENSING CONN ON REF# 11
CONT ON PLAN VIEW FWD
TO DECK MAINTENANCE SHOP CONT ON REF# 4
TO DK HOUSE CONT ON REF# 3
TO STEARING GEAR RM CONT ON REF# 7
FOR 615C SEE PART PLAN "J-J"
FWD
P1D - 4"
P4M - 2"
P4N - 2"
P4P - 2"
P4Q - 2"
P4R - 2"
P7 - 3/4"
P5C - 1 1/2"
P5B - 1 1/2"
P6 - 1"
F19 6" ABV VLV
F16
F18
V-400
V-407
V-409
V-398
V-399
H-12 W/EX LEG
H-67
33'-0" FLAT
24'-0" LVL
60'-0" LVL
BHD 23
FR 29
FR 26
FR 41

2652 -262

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.

SEPT. '80
FRAME 2
10X

2652.263

CSD VAULT

E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 12-7-76
SIGNED J.K. Johnson

YARD PRINTS | ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS																		
REV.	E	E	A	A	A	B	A	A	C	D	D	E	C	D	D	D	E
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	9A	3A	7A	9B	13

GROUP
MC NO.

DWG. REV. — HULL APPLIC.			
REV.	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	YES
E	YES	YES	NO

NNSB&DDCo HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C	311	T11-S-116a	
614C	310		
613C	309		

APPROVALS
OWNERS | ABS | USCG

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING

INSTALLATION GROUPS 2652-0115-1001 SI
2652-0115-1002 SI
2652-0117-1001 PI
2652-0118-1001 PI
2652-0402-1001 PI
2652-0119-1101 PI

ARR DWG 2652-262
PIPE DETAIL 2652-264

SCALE NONE =1 Ft.
DRAWN E.R. SMOOT
CHECKED T.E. SEAMAN
SECT. MGR. J.K. Johnson
DATE COMPL. 9-2-76
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 9-2-76
TECH. APPROVAL NOT REQ'D
CSD APPROVAL R.L. Harrington

HULL 613C

TYPE OF DWG.

TITLE
PIPING ARR HEATING STEAM SYS E.R. — LIST OF MATERIAL (14)

DWG. NO. 2652-263 REV E SHEET NO. 1 OF 13

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	AUTH'D	OWNER DATE	APPD.
A	ALL	INITIAL ISSUE	9/2/6		—	—
B	6 6 ~~3A~~ ~~3/4~~ ~~7~~	ADDED LINE 11, 12, & 12A. ALT'D VALVE NUMBERS LINE 7-10. ~~ADDED SHEET 3A; ALTERED GROUP SHEET~~ ~~Nº ON SHEETS 3 & 4.~~ ~~ADDED LINES 14, 15, 16, & 18.~~ WAS	5/2/7		—	—
C	9 9A 12	ADDED LINES 9, 10 & 13 ADDED ADDED	8/11/7		—	—
D	10 11 12 3A 7A 9B	ADDED LINES 11-14 ADDED LINES 9-14 ADDED LINES 13-14 ADDED ADDED ADDED	12/2/7		—	—
E	12 13	ADDED LINE 9. ADDED LINES 1, 2 & 3. (WORK ACCOMP. ON 613C)	12/7/8		—	—

NOTES
1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF #1.

NO.	REFERENCES	DWG. NO.
1	DIAG CONTAMINATED ST GENERATING SYS - LIST	6450-693

HULL NO. 613C, 614C, 615C DWG. NO. 2652-263 REV. E SHEET 2 OF —

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P5B	1½" IPS x STD THK PIPE STL	PIPE DET 2652-264	PS	
		2	1	P5Y				
		3	1	P5Z				
		4	1	P5AA				
		5	1	P6AB	1" IPS			
		6	30'-0"	P6		S 57-06-104K		
		7						
		8	1	V405	1" GLOBE STOP BRONZE 250# SCRD	PO ⑤ 6450-C27	MD-PS	
	ASSY #1	9	1	V406	½" TEMP REG 150# FLG STL	PIPE DET 2652-264	PS	
		10	1	V407	1" GLOBE STOP BRONZE 250# SCRD			
		11	1	V408	1" GATE			
		12	1	V409	1" GLOBE STOP			
		13	1	V411	1"	PO ⑤ 6450-C27	MD-PS	
		14						
		15	1	F1	2"x1" RED COUPLING 3000# S.W. STL	PO ⑤ 6951-C3	MD-PS	
		16	2	F2	1" COUPLING	③		
		17	2	F18	1" UNION 150# M.I. SCRD	S 25-12-168	ST-PS	
		18						

REMARKS -

SERVICE - SERV ST SYS-ER

APPLICABLE HULLS 613C 614C 615C

MC NO. PS 173

GROUP NO. 2652-0115-1001 SI SHT 1 OF 3

DWG NO. 2652-263 SHEET 3 REV. A

GROUP

REV.	QTY	HGR NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D	2	H-12	1½" SWING HGR W/EX LEG	S 25-47-366	ST-PS	
D	3	H-12	1"	S 25-47-346		
D	3	H-12	1½"	S 25-47-366		
D	2	H-12	1"	S 25-47-346		
D	1	H-13	1½"	S 25-48-366		
D	2	H-13	1"	S 25-48-346		
D	4	H-2	1" FIXED HGR	S 25-41-342		
D	1	H-2	1" W/EX LEG			
D	1	F100	1½" DECK SLV STL	S 25-20-390	ST-PS	

SERV ST SYS-ER

613C 614C 615C

GROUP NO. 2652-0115-1001 SI SHT 3A OF 3

DWG NO. 2652-263 SHEET 3A REV. D

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	4	Z-1	1¼"	BOLTS	½" HVY HEX HEAD L=2¼"	PO ㉛ 6000-C7	MD-PS	
	2	4			NUTS	½" HVY HEX	PO ① 6000-C11		
	3	1			GSKT	1/16" COMPRESSED ASBESTOS 150	S 15-01-266E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - SERV ST SYS-E.R.

APPLICABLE HULLS 613C 614C 615C

MC NO. PS 173

GROUP NO. 2652-0115-1001 SI SHT 3 OF 3

DWG NO. 2652-263 SHEET 4 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	✓	1	1	P1D	4" IPS x STD THK PIPE STL	PIPE DET 2652-264	PS	
	✓	2	1	P5C	1½" IPS			
	✓	3	1	P2G	3" IPS			
	✓	4	1	P4H	2" IPS			
		5	1	P5S	1½" IPS			
		6	1	P3T	2½" IPS			
		7	1	P5X	1½" IPS			
		8	1	P4AC	2" IPS			
		9	10'-0"	P6	1" IPS	S 57-06-104K		
		10	80'-0"	P7	¾" IPS x ¾" HVY THK	S 57-07-103K		
		11	50'-0"	P8	½" IPS	S 57-07-102K		
		12	8'-0"	P9	1½" IPS x STD THK	S 57-06-106K		
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - SERV ST SYS-E.R.

APPLICABLE HULLS 613C 614C 615C

MC NO. PS 173

GROUP NO. 2652-0115-1002 SI SHT 1 OF 4

DWG NO. 2652-263 SHEET 5 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V-398	3" GLOBE STOP 125# FLG CAST IRON	PIPE DET 2652-264	PS	
		2	1	V-399	1" 250# SCRD BRONZE			
		3	1	V-401	1½" TEMP REG SCRD	FURN ATTACHED TO HOT WTR HTR PO.6402-T2		
		4	1	V-402	1½" GLOBE STOP 125# SCRD			
		5	1	V-403	1½" GATE			
		6	1	V-404	1½" GLOBE STOP			
B		7	1	V-5013	1½"	PIPE DET 2652-264		
B		8	1	V-5014	¾"	S 26-09-148	ST-PS	
B		9	1	V-5015	½"	S 26-09-146		
B		10	1	V-5016	2" 125# FLG CAST IRON	PIPE DET 2652-264	PS	
B		11	1	V-400	1½" 250# GLOBE STOP SCR'D BRONZE			
B		12	1	V-410	2½" 125# GLOBE STOP FLG CAST IRON			
B		12A	1	V-5013	1½" 250# GLOBE STOP SCR'D BRONZE			
		13	5	F-2	1" COUPLING 3000# S.W. STL	PO ③ 6951-C3	MD-PS	
		14	1	F-3	1½" ELL 90°	⑥		
		15	3	F-4	1½" ELL 90° 150# SCRD M.I.	S 25-09-202	ST-PS	
		16	2	F-5	1½" TEE	S 25-11-182		
		17	2	F-6	1½" UNION	S 25-12-172		
		18	2	F-7	1½" x 1¼" BUSHING	S 25-05-736		

REMARKS -

SERVICE - SERV ST SYS-E.R

APPLICABLE HULLS 613C 614C 615C

MC NO. PS 173

GROUP NO. 2652-0115-1002 SI SHT 2 OF 4

DWG NO. 2652-263 SHEET 6 REV. B

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	F-8	1¼" SARCO STRAINER SCRD STL	S/ 26-03-126	ST-PS	
		2	2	F-9	4" BACKING RING STL (STD)	S 97-18-131		
		3	2	F-10	3"	S 97-18-126		
		4	1	F-11	2"	S 97-18-122		
		5	2	F-12	1" ELL 90° 3000# SW STL	PO ⑦ 6951-C3	MD-PS	
		6	4	F-13	¾" COUPLING	⑧		
		7	3	F-14	½"	⑨		
		8	1	F-15	1" DK SLEEVE STL	S 25-20-388	ST-PS	
		9	1	F-16	¾"	S 25-20-387		
		10	1	F-17	½"	S 25-20-386		
		11	1	F-18	1" UNION 150# SCRD M.I.	S 25-12-168		
		12	1	F-19	¾"	S 25-12-166		
		13	1	F-20	½"	S 25-12-164		
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - SERV ST SYS-E.R.

APPLICABLE HULLS 613C 614C 615C

MC NO. PS 173

GROUP NO. 2652-0115-1002 SI SHT 3 OF 4

DWG NO. 2652-263 SHEET 7 REV. A

GROUP

QTY	HGR NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
1	H-12	4" SWING HGR W/EX LEG	S 25-47-416	ST-PS	
3	H-12	1½"	S 25-47-366		
2	H-12	1"	S 25-47-346		
4	H-12	¾"	S 25-47-336		
1	H-12	4"	S 25-47-416		
1	H-12	3"	S 25-47-396		
1	H-12	2½"	S 25-47-386		
2	H-12	2"	S 25-47-376		
4	H-12	1½"	S 25-47-366		
8	H-12	1"	S 25-47-346		
5	H-12	¾"	S 25-47-336		
5	H-12	½"	S 25-47-326		
1	H-13	1"	S 25-48-346		
2	H-13	½"	S 25-48-326		
2	H-11	1"	S 25-46-346		
1	H-57	¾"	MO 283200 SH9 L7		
1	H-3	1" FIXED HGR	S 26-42-312		
1	TR-1	1½" TIE ROD	MO 283200 SH9 L1		

SERV ST SYS-ER

613C 614C 615C

GROUP NO. 2652-0115-1002 SI SH 3A OF 4

DWG NO. 2652-263 SHEET 7A REV. D

2652-263

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY TO SHIP	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	4	Z-2	3"	BOLTS	5/8" HVY HEX HEAD L=3"	PO 6000-C7 (25)	MD-PS	
	2	4			NUTS	5/8" HVY HEX	PO 6000-C11 (2)		
	3	1			GSKT	1/16 COMPRESSED ASBESTOS 150	S 15-01-274E	ST-PS	
	4	4	Z-3	2"	BOLTS	5/8 HVY HEX HD L=2 1/2"	PO 6000-C7 (27)	MD-PS	
	5	4			NUTS	5/8 HEX HD	PO 6000-C11 (2)		
	6	1			GSKT	1/16 COMP. ASB 150#	S 15-01-270E	ST-PS	

REMARKS -

SERVICE - SERV ST SYS-E.R.

MC NO PS 173

APPLICABLE HULLS: 613C 614C 615C

GROUP NO.

2652-0115-1002 SI
SHT 4 OF 4

DWG NO. 2652-263 | SHEET 8 | REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY TO SHIP	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P1E	4" IPS x STD THK PIPE STL	PIPE DET 2652-264	PS	
	2	1	P2F	3" IPS			
	3	1	P4J	2" IPS			
	4	1	P4K				
	5	1	P4L				
	6	1	P3U	2 1/2 IPS			
	7	1	P5V	1 1/2 IPS			
	8	1	P5W				
C	9	1	P1AD	4" IPS			
C	10	1	P1AE				
	11	1	F-10	3" BACKING RING STL (STD)	S 97-18-126	ST-PS	
	12	2	F-21	2 1/2	S 97-18-124		
C	13	2	F-9	4"	S 97-18-131		

REMARKS -

SERVICE - SERV ST SYS-ER

MC NO PS 164

APPLICABLE HULLS

GROUP NO.

2652-0117-1001 PI
SHT 1 OF 2

DWG NO. 2652-263 | SHEET 9 | REV. C

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY TO SHIP	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C	1	8	Z4	4"	BOLTS	5/8" HVY HEX HD L=3"	PO 6000-C7 (25)	MD-PS	
C	2	8			NUTS	5/8" HVY HEX	PO 6000-C12 (18)		
C	3	1			GSKT	1/16" COMP ASB 150#	15-01-278E	ST-PS	

REMARKS -

SERVICE - SERV ST SYS ER

APPLICABLE HULLS: 613C 614C 615C

GROUP NO.

2652-0117-1001 PI
SH 2 OF 2

DWG NO. 2652-263 | SHEET 9A | REV. C

GROUP

	QTY	HGR NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D	3	H-12	4" SWING HGR W/EX LEG	S 25-47-416	ST-PS	
D	2	H-12	2"	S 25-47-376		
D	1	H-12	4"	S 25-47-416		
D	2	H-12	2 1/2"	S 25-47-386		
D	1	H-12	2"	S 25-47-376		
D	2	H-12	1 1/2"	S 25-47-366		
D	1	H-13	3"	S 25-48-396		
D	3	H-13	2"	S 25-48-376		
D	1	SH-1	3" SPRING HGR	PO (124) 6552-C16		
D	1	SH-2	1 1/2"	PO (125) 6552-C16		

SERV ST SYS-ER

APPLICABLE HULLS: 613C 614C 615C

GROUP NO.

2652-0117-1001 PI
SH 2A OF 2

DWG NO. 2652-263 | SHEET 9B | REV. D

INSTALLATION GROUP

REV.	LINE NO.	QTY TO SHIP	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P4M	2" IPS x STD THK PIPE STL	PIPE DET 2652-264	PS	
	2	1	P4N				
D	11		HGR NO				
D	12	1	H-12	2" SWING HGR	S 25-47-376	ST-PS	
D	13	1	H-12	2" W/EX LEG			
D	14	1	H-3	2" FIXED HGR	S 25-42-372		

REMARKS -

SERVICE - SERV ST SYS-ER

MC NO PS 168

APPLICABLE HULLS: 613C 614C 615C

GROUP NO.

2652-0118-1001 PI
SHT 1 OF 1

DWG NO. 2652-263 | SHEET 10 | REV. D

INSTALLATION GROUP

REV.	LINE NO.	QTY TO SHIP	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P4P	2" IPS x STD THK PIPE STL	PIPE DET 2652-264	PS	
	2	1	P4Q				
	3	1	P4R				
D	9		HGR NO				
D	10	2	H-12	2" SWING HGR	S 25-47-376	ST-PS	
D	11	2	H-12	2" W/EX LEG			
D	12	1	H-13	2"	S 25-48-376		
D	13	1	H-57	2"	MO 283200 SH 10 L1		
D	14	1	H-2	2" FIXED HGR	S 25-41-372		

REMARKS -

SERVICE - SERV ST SYS-ER

MC NO PS 152

APPLICABLE HULLS: 613C 614C 615C

GROUP NO.

2652-0402-1001 PE
SHT 1 OF 1

DWG NO. 2652-263 | SHEET 11 | REV. D

INSTALLATION GROUP

	QTY	ITEM	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	P1AF	4" IPS x STD THK PIPE STL	PIPE DET 2652-264	PS	
	1	P1AG				
	1	P1AH				
	1	P1AJ				
	3	F-9	4" BACKING RING STL (STD)	S 97-18-131	ST-PS	
	1	V5069	4" GATE VLV 150# FLG STL	PIPE DET 2652-264	PS	
E	1	J-1	4" BLANK FLANGE 150# STEEL	LIAISON 613C-JWJ-28	ST-PS	
D		HGR NO				
D	4	H-12	4" SWING HGR	S 25-47-416	ST-PS	

SERV ST SYS ER

613C 614C 615C

2652-0119-1101 PI
SH 1 OF 2

2652-263 | 12 | E

FLANGED JOINT LIST & OUTFITTING GROUP

REV.	LINE	QTY TO SHIP	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
E	1	8	Z-4	4"	BOLTS	5/8" HVY HEX HD L=3"	PO 2600-C34 (4)	ST-PS	
E	2	8			NUTS	5/8" HVY HEX	PO 6000-C12 (18)		
E	3	1			GSKT	1/16" COMP ASBESTOS 150#	S 15-01-278E		

REMARKS -

SERV ST SYS ER.

614C

2652-0119-1101 PI
SH 2 OF 2

2652-263 | 13 | E

2652-263

MICRO-MASTER® 105 mm

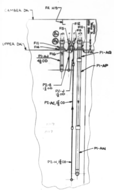
K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

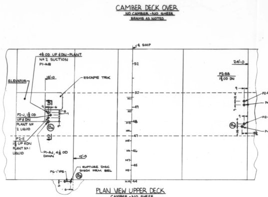
FRAME

8X


CAMBER DK
FR H13
F12
F5
F11
F8
SEE REF 4 FOR CONT
UPPER DK
F11
F14
F16
F14
P1-AJ
4⅛OD
P1-AQ
P1-AP
P2-E
1⅝OD
P2-J
1⅝OD
P2-AC, 1⅝OD
P1-AN
P2-H, 1⅝OD

SECTION "5-D"

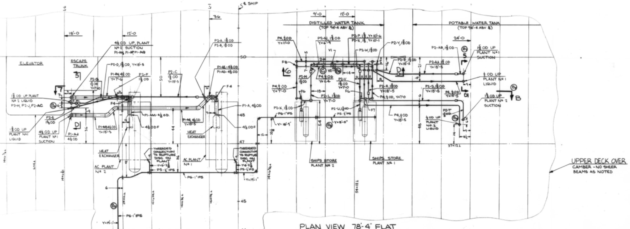
SCALE: ½=12


CAMBER DECK OVER
NO CAMBER - NO SHEER
BEAMS AS NOTED
℄ SHIP
4⅛OD UP & DN - PLANT
Nº 2 SUCTION
P1-AQ
ELEVATOR
18'-0
ESCAPE TRK
P2-J, 1⅝ OD
UP & DN
PLANT Nº
2 LIQUID
P2-E
1⅝ UP & DN
PLANT Nº 1
LIQUID
P1-AJ, 4⅛ OD
DOWN
12'-0
P6-1"IPS
1 RUPTURE DISC
DISCH FRM BEL
52
50
49
48
47
46
45
44
24'-0
P2-BB
1⅝OD DN
P2-AB, 1⅝ OD UP
P4, ½ OD UP
PLANT Nº 1
P2-T, 1⅝ OD UP
P4, ½ OD UP
PLANT Nº 2

PLAN VIEW UPPER DECK

CAMBER - NO SHEER
SCALE: ½=12
MOLDED DECK HT AT ℄ = 30'

Ⓑ REFRIGERATION INSULATION		
TUBING SIZE & SERVICE	INSUL THICK	SOURCE
½ OD(LIQUID)	½ ID x ¾ THICK	32-10-606
1⅝ OD(LIQUID)	1⅝ ID x ¾ THICK	32-10-626
1⅝ OD(SUCTION)	1ST LAYER 1⅝ ID x ¾ THK	32-10-626
	2ND LAYER 3⅛ ID x ¾ THK	32-10-640
4⅛ OD(SUCTION)	1ST LAYER 4⅛ ID x ¾ THK	32-10-644
	2ND LAYER ¾ THK SHEET	32-10-706


℄ SHIP
18'-0
12'-0
36
ELEVATOR
ESCAPE TRUNK
4⅛OD UP, PLANT
Nº 2 SUCTION
P1-AN, P1-AP, P1-AQ
P2-D, 1⅝OD, Y=18'-3
P2-G
1⅝OD
Y=7'-0
P1-AN, 4⅛OD
Y=7'-6
P2-F
1⅝OD
P2-C
1⅝OD
Y=18'-3
P2-A, 1⅝OD
P2-B, 1⅝OD
P1-AE-4⅛OD
P1-AD-4⅛OD
F4
1⅝ OD UP PLANT
Nº 2 LIQUID
P2-H, P2-J, P2-AC
P2-E
1⅝OD
1⅝OD UP
PLANT Nº 1
LIQUID
4⅛ OD UP
PLANT Nº 1
SUCTION
P1-AJ
4⅛OD
P1-AM-4⅛OD
P1-AM 4⅛OD
Y=18'-3
4⅛ODF
P1-AG 4⅛OD
Y=18'-3
P1-A, 4⅛OD
HEAT EXCHANGER
HEAT EXCHANGER
THREADED CONNECTION TO RUPTURE DISC ON PLANT
Y=6'-2⅜
P5-½"IPS
AC PLANT Nº 2
AC PLANT Nº 1
P6-1"IPS
Y=19'-1"
1" RUPTURE DISC DISCHARGE TO UPPER DK.
Y=18'-9"
DISTILLED WATER TANK
(TOP 94'-4 ABV ℄)
POTABLE WATER TANK
(TOP 94'-4 ABV ℄)
9'-0
12'-0
24'-0
P4, ½OD
Y=11'-0
P2-N, 1⅝OD
Y=6'-9
V1
P2-P, 1⅝, Y=10'-6
P2-X, 1⅝, Y=10'-1
P2-W, 1⅝OD
P2-Y, 1⅝OD
P2-Z, 1⅝OD
Y=18'-5
P2-AA, 1⅝OD
Y=18'-5
P2-AB, 1⅝OD
1⅝ OD UP
PLANT Nº 1
SUCTION
½ OD UP
PLANT Nº 1
LIQUID
F8
P2-M
1⅝OD
V2
P4, ½OD
Y=6'4
P2-V
1⅝OD
Y=7'-0
P4, ½ OD
Y=7'-0
F6
P2-L, 1⅝OD
Y=7'-0
P2-R, 1⅝OD
Y=18'-5
P4, ½OD, Y=7'-0
P2-S, 1⅝OD
Y=18'-5
P4, ½OD
Y=18'-5
1⅝OD UP
PLANT Nº 2
SUCTION
P2-K, 1⅝OD
P2-U, 1⅝OD
F7
P5-½"IPS
Y=8'-0"
P4, ½OD
Y=18'-5
P2-T
1⅝OD
½OD UP
PLANT
NO. 2
LIQUID
SHIPS STORE
PLANT Nº 2
SHIPS STORE
PLANT Nº 1
UPPER DECK OVER
CAMBER - NO SHEER
BEAMS AS NOTED
50
48
47
45
44

PLAN VIEW 78'-4" FLAT

NO CAMBER - NO SHEER
SCALE: ½=12
MOLDED DECK HT AT ℄ = 21'-0

REVISIONS						
REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH	OWNER DATE	OWNER APPD
A	—	INITIAL ISSUE	—	—	—	—
B	3D	1/ REFRIGERATION INSULATION TABLE AND NOTE 5 ADDED. NOTE 4 DELETED.				
	2B 7A	2/ SECT "7-B" EXPANDED TO SHOW STBD PENETRATIONS OF UPPER DK.				
	3B 4C 5A 6A 7B	3/ A COMBINED RUPTURE DISC DISCH TO THE WEATHER ADDED FOR EACH OF THE REFRIG AND A.C. PLANTS.				
	5B 3C 8B	4/ UPPER DK PENETRATIONS FOR LIQUID AND SUCTION LINES TO REFRIG PLT NO. 2 RELOCATED AND SHOWN IN SECT "7-B".				
	1B 5D 6B 8B	5/ RESERVATION ① DELETED. FREON PIPING INSULATING PENETRATIONS FOR UPPER DECK ADDED.				
	4C 5B 6B	6/ HOLE CUT IN UPPER DK FOR FREON LIQUID LINE ON PLT NO. 2 RELOCATED INBD TO FACILITATE INSTALLATION OF INSULATING PENETRATIONS. PIPING ALTERED TO SUIT.				
	3B 4D	7/ ELEV "5-D1" ADDED.				
	4B	8/ HANDWHEEL ORIENTATION ADDED IN PLAN VIEW FOR VALVES V1 & V2.				
	7C	9/ VALVE NO. V-2 ADDED IN ELEV "7-C".				
	-	10/ SHIP JOINTS INDICATED THROUGHOUT FOR DETAILED PIPES.				
	5D 6C 8C	11/ PIPING ABOVE MAIN DK FR 44-52 MODIFIED TO SUIT INTERFACE WITH HOPEMAN PLANS.				
	-	12/ PIPE DETAIL NUMBERS MODIFIED THROUGHOUT TO AGREE WITH PIPE DETAIL NUMBERING SYS.	DMM 9-6-77			
	-	APPROVAL LETTER DATES ADDED TO TITLE BLOCK				
C	3B 6C 6D 7C	1/ PLAN VIEW 78'-4 FLAT, FR 49-50, STBD - 1⅝"OD SUCTION LINES TO SHIPS STORES PLANT NO. 1 & 2 MODIFIED TO REDUCE LOOP SIZE. DETAILED PIPES P2-N, P2-M, AND P2-W MODIFIED AND LIQUID LINE P4-½"OD MODIFIED TO SUIT ARRANGEMENT. SECT "6D" AND ELEV "7C" MODIFIED TO SUIT.				
	8C	2/ UPPER DECK, FR 47-48, STBD - SECTION "7B" FITTING ON 1⅝"OD SUCTION LINE MADE F22 IN LIEU OF F5.	DMM 11-23-77			

AUTHORITY:

GENERAL NOTES:

1- HANGERS TO BE IN ACCORDANCE WITH REF SHEET 13.

2- PRELIMINARY TEST WITH R-12 AT 20 PSI. FINAL TEST PRESSURE 225 PSI FOR HIGH SIDE AND 150 PSI FOR LOW SIDE BY ADDITION OF NITROGEN OR DRY CO_2.

3- BEFORE SOLDERING, OPEN PACKLESS VALVES HALFWAY AND APPLY HEAT TO ONLY ONE SOCKET AT A TIME, COMPLETING JOINT. COOL VALVE WITH DAMP CLOTH WHEN FINISHED.

4- ~~INSULATION IS AS FOLLOWS: FOR LIQUID LINES USE ¾" CELLULAR PLASTIC. FOR SUCTION LINES USE DOUBLE LAYER OF ¾" THK INSULATION.~~ Ⓑ

Ⓑ 5- FOR INSULATION THICKNESS SEE PANEL "3-D".

Ⓑ RESERVATIONS:

① - RESERVE PENETRATIONS PENDING DEVELOPMENT OF DETAIL FOR STRUCTURAL ISOLATION FOR FREON PIPING.

615C		
614C		
613C		
NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME

APPROVALS	
OWNERS SHELL LTR 1459V DATED 2-11-77 [illegible] LTR. DATED 2-16-77	ABS LTR DATED 3-24-77
	USCG LTR DATED 3-28-77

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
COMMERCIAL DESIGN DEPT.

SCALE ½ - ¼ = 1 FT
DRAWN L.L. CHASE
CHECKED
SECT MGR F.H. Schellenberg
DATE COMPL. 11/10/76
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 12-10-76
TECH APPROVAL
C S D APPROVAL R. L. Harrington

390,000 D.W.T. TANKER
REFRIGERATION PIPING - ENGINE ROOM
AND UPPER DECK FR 44-53 - ARRANGEMENT

NO.	REFERENCES	DWG NO.
4	REFRIG. PIPING CAMBER DK & ABV	2670-108
3	STD HNGERS & INSTALLATION INSTR	257056
2	" " " " - PIPE DETAILS	2670-107
1	REFRIG PIPING ENG RM & UPPER DK B/M	2670-106

U S M A DESIGN
U S M A DWG NO.
HULL NO.
DWG NO. 2670-105
REV C
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING YES
REMARKS REVISION "C"
DATE 11-23-77 SIGNED
YARD PRINTS
ORDERED BY DESIGN
GROUP:
MC NO.

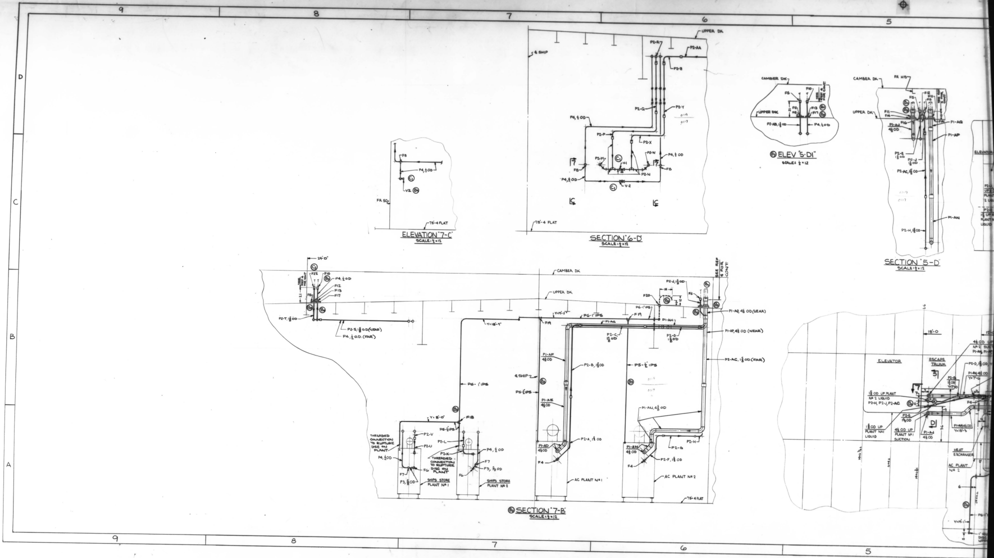
2670 -105

MICRO-MASTER 105 mm

SEPT. '80

FRAME 1

10X



9
8
7
6
5
D
C
B
A
UPPER DK
CAMBER DK
℄ SHIP
P2-R
P2-AA
P2-Z
P2-Q
P2-Y
P4, ½ OD
P2-P
P2-X
P2-M
P2-W
P2-N
V-1
V-2
F8
C1
78'-4 FLAT
FR 50½
V2
B4
CAMBER DK
F5
F10
F12
F6
F13
F17
B11
B7
UPPER DK
P2-AB, 1⅝ OD
P4, ½ OD
FR H13
F5
F12
F11
F8
F11
F14
F16
P1-AJ 4⅛ OD
P1-AQ
P1-AP
P2-E 1⅝ OD
P2-J 1⅝ OD
P2-AC, 1⅝ OD
P1-AN
P2-H, 1⅝ OD
SEE REF 4 FOR CONT
24'-0"
C2
F22
F10
P4, ½ OD
F12
F13
F17
F15
21
B9
B4
P2-T, 1⅝ OD
P2-S, 1⅝ O.D. (NEAR)
P4, ½ O.D. (FAR)
UPPER DK
P2-J, 1⅝ OD
F20
15
12
F5
P6-1" IPS
P1-AQ, 4⅛ OD (NEAR)
Y=19'-1"
Y=18'-9"
P6-1" IPS
F19
P1-AG
P1-AH
P1-AP, 4⅛ OD (NEAR)
P2-C, 1⅝ OD
P2-D, 1⅝ OD
P1-AF 4⅛ OD
P2-B, 1⅝ OD
P5-½" IPS
P2-AC, 1⅝ OD (FAR)
℄ SHIP
B3
P5-½ IPS
P6-1" IPS
P1-AE 4⅛ OD
P1-AN, 4⅛ OD
Y=8'-0"
F18
P5-½ IPS
THREADED CONNECTION TO RUPTURE DISC ON PLANT
P2-V
P2-U
P2-L
P2-K
THREADED CONNECTION TO RUPTURE DISC ON PLANT
P4, ½ OD
P4, ½ OD
F7
F6
P3, ⅝ OD
F6
F7
P3, ⅝ OD
SHIPS STORE PLANT Nº 1
SHIPS STORE PLANT Nº 2
P1-AD 4⅛ OD
F4
P2-A, 1⅝ OD
AC PLANT Nº 1
P1-AM 4⅛ OD
F4
P2-F, 1⅝ OD
P2-G
P2-H
AC PLANT Nº 2
78'-4 FLAT
18'-0
12'-0
ELEVATOR
ESCAPE TRUNK
4⅛ OD UP Nº 2 SUCT P1-AN, P1-AP
P2-D, 1⅝ OD
P1-AN 4⅛ OD Y=7'-6
P2-G 1⅝ OD Y=7'-0
1⅝ OD UP PLANT Nº 2 LIQUID P2-H, P2-J, P2-AC
P2-E 1⅝ OD
1⅝ OD UP PLANT Nº 1 LIQUID
4⅛ OD UP PLANT Nº 1 SUCTION
P1-AJ 4⅛ OD
P1-AN 4⅛ OD Y=18'-3
36
HEAT EXCHANGER
AC PLANT Nº 2
F4
6
B3
Y=19'-1"
P6-1"

ELEVATION "7-C"
SCALE: ½ = 12

SECTION "6-D"
SCALE: ½ = 12

B7 ELEV "5-D1"
SCALE: ½ = 12

SECTION "5-D"
SCALE: ½ = 12

B2 SECTION "7-B"
SCALE: ½ = 12

2670 -105

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 2
10X

2670.106 CSD VAULT

E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS REV. "D"
GROUPING YES
DATE 8-21-78
SIGNED

SPECIAL PRINTS | DATE ISSUED | REV. | NO. PRTS | DEPT. | FIRST ISSUE
YARD PRINTS
ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS									
REV.	D	D	C	C	D	C	C	C	B
SHEET	1	2	3	4	5	6	7	8	9

GROUP
MC NO.

615C			
614C			
613C			
NNS&DDCO HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
	NN HULLS ONLY		
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	NO

APPROVALS
OWNERS SHELL LTR 1459W 2-22-77
ZAPATA LTR DATED 2-16-77
ABS 3-8-78
USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division FSCM NO. 43689
DESIGN DIVISION DEPT. COMMERCIAL DESIGN

FOR ARRGT SEE N.N. DRAWING 2670-105

COMPLETE ISSUE ☐
PARTIAL ISSUE ☒

SCALE = 1 Ft.
DRAWN L.L. CHASE
CHECKED
SECT. MGR. V.R. Schellenberg
DATE COMPL. 12/10/76
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 12-10-76
TECH. APPROVAL
CSD APPROVAL R. L. Harrington

GROUPED BY CHK. | DATES PART COMP. | HULL GROUP NO. KEY
TYPE OF DWG.

TITLE 390,000 D.W.T. TANKER
REFRIGERATION PIPING - ENGINE ROOM AND UPPER DECK - BILL OF MATERIAL

DWG. NO. 2670-106 REV D SHEET NO. 1 OF 9

MS 8½ X 14

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D	OWNER DATE	OWNER APPD.
A	—	INITIAL ISSUE	—	—	—	—
B	3	LINE 1 - PIPE NO. WAS P1-A. LINE 2 - PIPE NO. WAS P1-B. LINE 3 - PIPE NO. WAS P1-J. LINE 4 - PIPE NO. WAS P1-K. LINE 11, 12, 13, 17 & 18 ADDED.				
	4	LINE 4 - QTY WAS 2. LINE 5 - QTY WAS 9. LINE 11, 12, 13, 14 ADDED.				
	5	LINE 1 & 2 - MAT'L SOURCE ADDED.				
	6	LINE 1 - PIPE NO. WAS P1-C. LINE 2 - PIPE NO. WAS P1-D. LINE 3 - PIPE NO. WAS P1-E. LINE 4 - PIPE NO. WAS P1-F. LINE 5 - PIPE NO. WAS P1-G. LINE 6 - PIPE NO. WAS P1-H. LINE 7 - PIPE NO. WAS P1-L. LINE 8 - PIPE NO. WAS P1-M.				
	7	LINE 3 - PIPE NO. WAS P2-BB. LINE 4 - PIPE NO. WAS P2-CC. LINE 6, 7, 13, 14, 15 ADDED.				
	8	LINE 6 THRU 17 ADDED.				
	9	LINE 5 - QTY, DESCRIPTION AND MAT'L SOURCE MODIFIED	DWM 4/7/77			
	1	OWNER APPROVAL LETTER DATES ADDED TO TITLE BLOCK.				
C	3	LINE 1, 2, 3 & 4 - SPEC FOR TUBING ADDED. LINE 5, 6, 7 & 8 - MATERIAL WAS TY'L'. SPEC ADDED. LINE 9 & 10 - MATERIAL WAS TYPE "L" AND MATERIAL SOURCE ALTERED. SPEC ADDED. LINE 11, 12, 13, 17 & 18 - MATERIAL WAS TYPE "L". SPEC ADDED.				
	4	LINE 1, 2, 3, 5, 9 - SPEC ADDED. LINE 4, 6, 7, 8, 10 - SPEC ADDED. MATERIAL SOURCE ALTERED. LINE 11, 12, 13, 14 - MATERIAL WAS TYPE "L". SPEC ADDED. LINE 15 - ADDED.				
	6	LINE 1 THRU 8 - SPEC ADDED. LINE 9 THRU 18 - MATERIAL WAS TYPE "L". SPEC ADDED.				
	7	LINE 1 THRU 4 - MATERIAL WAS TYPE "L". SPEC ADDED. LINE 5 - MATERIAL WAS TYPE "L". MATERIAL SOURCE ALTERED. SPEC ADDED.				
	8	LINE 1 THRU 4 - SPEC ADDED. LINE 5 - MATERIAL SOURCE ALTERED. SPEC ADDED. LINE 13 - QTY ADDED. SPEC ADDED. MATERIAL SOURCE ALTERED. LINE 18 - ADDED.	DWM 11-28-77	AC		
D	1	COMPLETE / PARTIAL ISSUE BLOCK ADDED. ABS & USCG APPROVAL BLOCKS COMPLETED.		AC		
	5	LINE 1 - MAT'L SOURCE WAS P.O. 2670-C9 ①.	8-21-78 DWM			

NO.	REFERENCES	DWG. NO.

HULL NO. 613C, 614C, 615C DWG. NO. 2670-106 SHEET 2 OF 9

MS 8½ X 14

GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	P1-AD	4⅛ OD COPPER TUBING ASTM B88 TYPE "K" HARD DRAWN	PMO-2670-107	PS	
C		2	1	↓ AE	↓	↓	↓	
C		3	1	AM	↓	↓	↓	
C		4	1	↓ AN	↓	↓	↓	
C		5	1	P2-A	1⅝ ↓	↓	↓	
C		6	1	↓ F	↓	↓	↓	
C		7	1	G	↓	↓	↓	
C		8	1	↓ H	↓	↓	↓	
C		9	12"	P3	⅝ ↓	PO 613C-2670 C10 ②	↓	
C		10	56'0"	P4	½ ↓	↓ ①	↓	
C		11	1	P2-K	1⅝ ↓	PMO 2670-107	↓	
C		12	1	P2-L	↓	↓	↓	
C		13	1	P2-M	↓	↓	↓	
A		14	5	H15-A	HANGER FOR 4⅛ OD COPPER TUBING	S 25-49-820	ST-PS	
A		15	5	H15A	↓ ↓ 1⅝ OD	S 25-49-810	↓	
A		16	10	H15A	↓ ↓ ½ OD	S 25-49-800	↓	
C		17	1	P2-N	1⅝ OD COPPER TUBING ASTM B88 TYPE "K" HARD DRAWN	PMO 2670-107	PS	
C		18	1	P2-P	↓ ↓ ↓	↓	↓	

REMARKS -

SERVICE - REFRIGERATION PIPING & HANGERS
PS-162
GROUP NO. 2670-0117-1001-PI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 2670-106 SHEET 3 REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	4	F1	4⅛ OD, 90° ELL, COPPER ASTM B-75 SHORT RADIUS	FURN ON PIPE DETAIL	PS	
C		2	2	F2	4⅛ OD, 45° ELL, COPPER, ASTM B75	↓	↓	
C		3	2	F3	4⅛ OD COUPLING, COPPER ASTM B-75	↓	↓	
C		4	3	F4	1⅝ OD, 90° ELL, COPPER ASTM B-75 SHORT RADIUS	PO 613C 2670-C11 ⑥	ST-PS	
C		5	16	F5	1⅝ OD COUPLING, COPPER ASTM B-75	FURN ON PIPE DETAIL	PS	
C		6	2	F6	⅝ OD, 90° ELL, COPPER ASTM B75	PO 613C 2670-C11 ③	ST-PS	
C		7	2	F7	⅝ OD - ½ OD REDUCER, COPPER ASTM B-75	↓ ④	↓	
C		8	2	F8	½ TEE, COPPER ASTM B75	↓ ②	↓	
C		9	2	F9	1⅝ ↓ ↓ ASTM B75	FURN ON PIPE DETAIL	PS	
C		10	8	F10	½ OD COUPLING, COPPER ASTM B-75	PO 613C 2670-C11 ①	ST-PS	
C		11	1	P2-U	1⅝ OD COPPER TUBING ASTM B88 TYPE "K" HARD DRAWN	PMO 2670-107	PS	
C		12	1	P2-V	↓ ↓ ↓	↓	↓	
C		13	1	P2-W	↓ ↓ ↓	↓	↓	
C		14	1	P2-X	↓ ↓ ↓	↓	↓	
C		15	2	F23	1⅝ OD, 45° ELL, COPPER ASTM B75	FURN ON PIPE DETAIL	PS	
		16						
		17						
		18						

REMARKS -

SERVICE - REFRIGERATION PIPING (FITTINGS)
PS-162
GROUP NO. 2670-0117-1001-PI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 2670-106 SHEET 4 REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D		1	1	V1	REFRIG. VALVE (PACKLESS) - 1⅝	PMO 2670-107, PIPE DETAIL P2-N	MD-PS	
B		2	1	V2	↓ ↓ ↓ ½	PO 2670-C9 ②	↓	
		3						
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - REFRIGERATION PIPING (VALVES)
PS-162
GROUP NO. 2670-0117-1001-PI
APPLICABLE HULLS 613C YES 614C YES 615C NO
DWG NO. 2670-106 SHEET 5 REV. D

GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	P1-AF	4⅛ OD COPPER TUBING ASTM B88 TYPE "K" HARD DRAWN	PMO-2670-107	PS	
C		2	1	↓ AG	↓	↓	↓	
C		3	1	AH	↓	↓	↓	
C		4	1	AJ	↓	↓	↓	
C		5	1	AK	↓	↓	↓	
C		6	1	AL	↓	↓	↓	
C		7	1	AP	↓	↓	↓	
C		8	1	↓ AQ	↓	↓	↓	
C		9	1	P2-B	1⅝ ↓	↓	↓	
C		10	1	↓ C	↓	↓	↓	
C		11	1	D	↓	↓	↓	
C		12	1	E	↓	↓	↓	
C		13	1	J	↓	↓	↓	
C		14	1	Q	↓	↓	↓	
C		15	1	R	↓	↓	↓	
C		16	1	S	↓	↓	↓	
C		17	1	T	↓	↓	↓	
C		18	1	↓ Y	↓ ↓ ↓ ↓	↓	↓	

REMARKS -

SERVICE - REFRIGERATION PIPING
PS-153
GROUP NO. 2670-0119-1001-PI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 2670-106 SHEET 6 REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	P2-Z	1⅝ OD COPPER TUBING ASTM B88 TYPE "K" HARD DRAWN	PMO-2670-107	PS	
C		2	1	↓ -AA	↓ ↓ ↓	↓	↓	
C		3	1	-AB	↓ ↓ ↓	↓	↓	
C		4	1	↓ -AC	↓ ↓ ↓	↓	↓	
C		5	60'0"	P4	½ ↓ ↓	PO 613C 2670-C10 ①	↓	
B		6	38'0"	P5	½ SCH 40 STEEL PIPE	57-06-102	↓	
B		7	50'0"	P6	1 SCH 40 STEEL PIPE	57-06-104	↓	
		8						
		9						
A		10	10	H15-A	HANGER FOR 4⅛ OD TUBING	S 25-49-820	ST-PS	
A		11	15	H15-A	↓ ↓ 1⅝ OD	S 25-49-810	↓	
A		12	20	H15-A	↓ ↓ ½ OD	S 25-49-800	↓	
B		13	2	H3	1" FIXED HANGER IN WAY OF HOLE CUT WITHOUT LINER	25-42-042	↓	
B		14	5	H1	1" FIXED HANGER SINGLE LEG WITHOUT LINER	25-40-042	↓	
B		15	3	H1	½" FIXED HANGER SINGLE LEG WITHOUT LINER	25-40-022	↓	
		16						
		17						
		18						

REMARKS -

SERVICE - REFRIGERATION PIPING & HANGERS
PS-153
GROUP NO. 2670-0119-1001-PI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 2670-106 SHEET 7 REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	5	F1	4⅛ OD, 90° ELL, COPPER, SHORT RAD ASTM B-75	FURN ON PIPE DETAILS	PS	
C		2	3	F2	4⅛ OD, 45° ELL, COPPER ASTM B-75	↓	↓	
C		3	3	F3	4⅛ OD COUPLING, COPPER ASTM B-75	↓	↓	
C		4	15	F5	1⅝ OD COUPLING, COPPER ASTM B-75	↓	↓	
C		5	10	F10	½ OD COUPLING, COPPER ASTM B-75	PO 613C 2670-C11 ①	ST-PS	
B		6	2	F11	DECK SLEEVE FOR 4⅛" O.D. COPPER TUBING	M.O. 283201 SHEET 3 LINE 1	↓	
B		7	4	F12	DECK SLEEVE FOR 1⅝" O.D. COPPER TUBING	M.O. 283201 SHEET 3 LINE 2	↓	
B		8	2	F13	DECK SLEEVE FOR ½" O.D. COPPER TUBING	M.O. 283201 SHEET 3 LINE 3	↓	
B		9	2	F14	INSULATING BHD FITTING FOR 4⅛" O.D. COPPER (SUCTION) TUBING	M.O. 283201 SHEET 4 LINE 1	↓	
B		10	2	F15	INSULATING BHD FITTING FOR 1⅝" O.D. COPPER (SUCTION) TUBING	M.O. 283201 SHEET 5 LINE 1	↓	
B		11	2	F16	INSULATING BHD FITTING FOR 1⅝" O.D. COPPER (LIQUID) TUBING	M.O. 283201 SHEET 6 LINE 1	↓	
B		12	2	F17	INSULATING BHD FITTING FOR ½" O.D. COPPER (LIQUID) TUBING	M.O. 283201 SHEET 7 LINE 1	↓	
C		13	4	F5	1⅝ OD COUPLING, COPPER ASTM B-75	PO 613C 2670-C11 ⑤	↓	
B		14	1	F18	1X½X½ TEE, SW STEEL	25-60-242	↓	
B		15	2	F19	1X1X½ TEE, SW STEEL	25-60-235	↓	
B		16	1	F20	DECK SLEEVE FOR 1" SCH 40 STEEL PIPE	25-20-358	↓	
B		17	5	F21	1 IPS COUPLING, SW, STEEL	25-60-054	↓	
C		18	1	F22	1⅝ OD X 1⅜ OD REDUCING COUPLING ASTM B75	PO 613C 2670-C11 ⑧	MD-PS	

REMARKS -

SERVICE - REFRIGERATION PIPING (FITTINGS)
PS-153
GROUP NO. 2670-0119-1001-PI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 2670-106 SHEET 8 REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A		1	16'6"		INSULATION - CELLULAR PLASTIC FOR ½ OD TUBING	S 32-10-606	ST-PC	
A		2	75'6"		INSULATION - CELLULAR PLASTIC FOR 1⅝ OD TUBING	S 32-10-626	↓	
A		3	65'6"		INSULATION - CELLULAR PLASTIC FOR 4⅛ OD TUBING	S 32-10-644	↓	
A		4	75'6"		INSULATION - CELLULAR PLASTIC FOR 3⅛ OD TUBING	S 32-10-640	↓	
B		5	5 SHTS		INSULATION - CELLULAR PLASTIC SHEET ¾" THICK	S 32-10-706	↓	
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - REFRIGERATION INSULATION
PC-169
GROUP NO. 2670-0117-1002-SI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 2670-106 SHEET 9 REV. B

2670-106

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.

SEPT. '80
FRAME 1
8X

REMARKS
1/4" O.D. X .030 WALL
.750 O.D. X .065 WALL
1.125 O.D. X .065 WALL
1.625 O.D. X .072 WALL
2.125 O.D. X .083 WALL
4.125 O.D. X .134 WALL
3.125 O.D. X .109 WALL
MUELLER #W 2715 OR EQUAL
NIBCO # 607 OR EQUAL
NIBCO #707 OR EQUAL
NIBCO # 611 OR EQUAL
2 1/8 O.D. X .247 WALL
2 1/8 O.D. X .250 WALL
4 5/8 O.D. X .247 WALL
4 5/8 O.D. X 250 WALL
NIBCO #611 OR EQUAL
NIBCO # 611 OR EQUAL
NIBCO # 611 OR EQUAL
NIBCO # 611 OR EQUAL
MUELLER # W-1003 OR EQUAL
MUELLER # A-15165 OR EQUAL
HENRY VALVE # 6297
MUELLER # A-15167 OR EQUAL
BY CARRIER W/UNIT
CARRIER W/UNIT
W/UNIT
MUELLER # A-15580 OR EQUAL
BY CARRIER W/UNIT
CARRIER W/UNIT
NIBCO # 606 OR EQUAL
NIBCO # 606 OR EQUAL
COMMERCIAL
FLAGG No. 1045 OR EQUAL
FLAGG No. 1045 OR EQUAL
JOB TO LOCATE AS REQD.

LIST OF MATERIAL - REFRIGERATED STORE ROOMS

PIPE LIST

REV.	ITEM	PART NO.	SIZE	DESCRIPTION	MATERIAL	SPEC.	REMARK
	P1	PL-534-03	1/4" O.D.	COPPER TUBING TYPE 122	COPPER	ASTM-B-280	.250 O.D. X .030 WALL
	P2	PL-500-02	3/8"	SEAMLESS COPPER TUBE	TYPE "K" (HARD)	ASTM-B-88	.500 O.D. X .049 WALL
	P3	03	1/2"				.625 O.D. X .049 WALL
	P4	05	3/4"				.875 O.D. X .065 WALL
	P5	07	1 1/4"				1.375 O.D. X .065 WALL
	P6	08	1 1/2"				1.625 O.D. X .072 WALL
	P7	PL-062-50	3"	STEEL NIPPLE 3" LONG	SCH. 40	ASTM-A-53	

PIPE SIZES SHOWN ON PLAN ARE O.D. SIZES. FITTINGS ARE NOMINAL SIZES, ADD 1/8" TO NOMINAL TO CONVERT TO O.D. SIZE.

MATERIAL LIST

REV.	ITEM	PART NO.	SIZE	DESCRIPTION	MATERIAL	SPEC.	REMARK
FURNISHED BY N.N.	40	PL-050-20		MARINE UNIT COOLER FOR 0°	FREEZE ROOM	#AL 45-164	W/ELECT. DEFROST ALL-TEMP
	41	21		MARINE UNIT COOLER FOR 35°	CHILL ROOM	#AL 58-260	
	42	23	1/2" ODF	STRAINER HENRY #8760-A			
	43	24	1/2" ODF	VALVE SOLENOID ALCO #200RA4SAM PILOT OPERATED 120V. 60HZ			
	44	25	1/2" O.D.F. INLET	5/8" O.D.F. INLET 10' CAP. VALVE THERMAL EXPANSION TYPE TCLE 2FW ALCO FREEZE RM.			
	45	26	1/2" O.D.F. INLET	5/8" O.D.F. INLET 10' CAP. VALVE THERMAL EXPANSION TYPE TCLE 1FW ALCO CHILL RM.			
	46	27		THERMOMETER 4 1/2" WEKSLER #415B-APL MERCURY FILLED RANGE -40° TO 110°F CAP. 10' (CHILL RM) 15' (FREEZE RM)			
	47	28		EVAPORATOR PRESSURE REGULATOR ALCO #EPR-12 GAUGE PORT 1/4" F.P.T.			
	48	29		PRESSURE GAUGE 3 1/2" WEKSLER BQ-13P RANGE 30" VAC. TO 150 P.S.I.			
	49	30		RIBBON HEAT COX & CO #NHL12-110 120V. (FREEZE RM. DRAIN LINES)			
	50	31		TIME CONTROL BULL 374 PARAGON 115V. 60HZ 1PH.			
	51	PL-537-11	1 1/2" x 3/8"	ELBOW REDUCING CXC	WROT COPPER	ANSI-B16.22	NIBCO #607 OR EQUAL
	52	PL-538-14	1 1/2" x 3/4"	ELBOW REDUCING CXC			607LT
	53	PL-537-23	1 1/2"	ELBOW CXC			607
	54	PL-550-13	1/2" x 3/8"	COUPLING REDUCING			600
	55	PL-543-04	1/2"	45° ELBOW CXC			606
	56	PL-537-06	1/2"	90° ELBOW CXC			607
	57	PL-547-15	1 1/2" x 1 1/2" x 1/2"	TEE REDUCING CXCXC			611
	58	PL-556-04	1/2" x 3/8"	FTG. REDUCER FTG. x C			600-2
	59	PL-556-03	3/8" x 1/8"	FTG. REDUCER FTG. x C			600-2
	60	PL-543-09	1 1/2"	45° ELBOW CXC			606
	61	PL-546-41	1/2" x 3/8" x 1/2"	TEE REDUCING CXCXC			611
	62	PL-546-21	3/8"	TEE CXCXC			611
	63	PL-543-03	3/8"	45° ELBOW CXC			606
	64	PL-537-04	3/8"	90° ELBOW CXC			607
	65	PL-537-21	1 1/4"	90° ELBOW CXC			607
	66	PL-546-99	1 1/4" x 1 1/4" x 3/8"	TEE REDUCING CXCXC			611
	67	PL-546-97	1 1/4" x 1 1/4" x 3/4"	TEE REDUCING CXCXC			611
	68	PL-537-12	3/4"	90° ELBOW CXC			607
	69	PL-543-08	1 1/4"	45° ELBOW CXC			606
	70	PL-546-59	3/4"	TEE CXCXC			611
	71	PL-560-19	3/4"	ADAPTER C x F.P.T.			603
	72	PL-568-05	3/4"	90° ELBOW C x F.P.T.	CAST BRONZE	ANSI-B16.18	707-3
	73	PL-546-02	1/8"	TEE CXCXC	WROT COPPER	ANSI-B16.22	611
	74	PL-062-02	1/4" O.D.	90° ELBOW CXC	WROT COPPER	ANSI-B16.22	MUELLER W-2715
	75	PL-062-03	1/4" O.D.	FEMALE CONNECTOR	BRASS FORGING		IMPERIAL EASTMAN #66-F
	76	PL-062-04	1/4" O.D.	LONG FORGED NUT 1/4" O.D. TUBE X 1/4" SAE			#161-F
	77	PL-062-05	1/4" O.D.	MALE CONNECTOR	BRASS FORGING		#68-F
	78	PL-070-23	1/4" O.D.	LINE VALVE CXC	CAST BRONZE	MIL-V-20064E	MUELLER A-14838
	79	PL-070-24	1/2" O.D.	LINE VALVE CXC	CAST BRONZE	MIL-V-20064E	MUELLER A-14841
	80	PL-070-25	7/8" O.D.	LINE VALVE CXC	CAST BRONZE	MIL-V-20064E	MUELLER A-15250
	81	PL-070-26	1 3/8" O.D.	LINE VALVE CXC	CAST BRONZE	MIL-V-20064E	MUELLER A-15252
	82	PL-149-55	1/2" O.D. CU.TU.	STEEL SLEEVE	STEEL TUBING	GR 1015	1 1/8 O.D. X .247 WALL 3" LONG.
	83	PL-149-57	3/8" O.D. CU.TU.				1 1/4 O.D. X .247 WALL 3" LONG.
	84	PL-149-58	7/8" O.D. CU.TU.				1 3/8 O.D. X .247 WALL 3" LONG.
	85	PL-149-63	1 3/8" O.D. CU.TU.				1 7/8 O.D. X .247 WALL 3" LONG.
	86	PL-149-64	1 5/8" O.D. CU.TU.				2 1/8 O.D. X .247 WALL 3" LONG.
	92	PL-070-27	5/8 O.D.	LINE VALVE CXC	CAST BRONZE	MIL-V-20064E	MUELLER A-14842
	93	PL-629-01	1/8"	PLUG, SOLID SQUARE HD	CAST BRONZE	ANSI-B16.18	FLAGG No. 4174-070 OR EQUAL
	94	PL-092-01		INSULATING RING - COMPRESSED ASBESTOS			COMMERCIAL
	95	PL-037-01	1/4" TK.	NEOPRENE GASKET MATERIAL			
	96	PL-421-11	3"	SCREWED CAP FOR 3" I.P.S. PIPE	150#	ASTM-A-197	FLAGG No. 1045 OR EQUAL
	97	PL-070-32	1/2"	GLOBE EXPANSION VALVE	CAST BRONZE	MIL-V-20064E	HENRY VALVE #6294
	98	PL-050-28	7/8" O.D.F.	FLANGE SET RX-173			FURNISHED W/ITEM #47
	99	PL-559-20	3/4"	ADAPTER C x MPT	WROT COPPER	ANSI B16.22	NIBCO #604 OR EQUAL
	100	SEE REF 9		TEMP CONTROL SWITCH 'DETROIT' FURNISHED BY CARRIER W/UNIT			
	101	PL 562-01	1/8"	ADAPTER FTG x F	WROT COPPER	ANSI B16.22	NIBCO 603-2
	102	PL 062-11	1/4" O.D	COUPLING, SWIVEL 7/16x20 THD	BRASS.		IMPERIAL EASTMAN FN04-04 NJ. OR EQUAL
	103	PL 062-12	1/4"	REFRIG ACCESS VALVE 3/16 O.D TUBE OR 1/4 O.D. 3/8 SOLDER	BRASS		PT40435 "ROBIN AIR"

REVISIONS

REV	ZONE	DESCRIPTION	N.N.S.&D.D.CO DATE	N.N.S.&D.D.CO AUTHO	OWNER DATE	OWNER APPD
0		SUBMITTED FOR APPROVAL 5-13-77	6-?-77	R.L.H.	8-25-77 8-1-77	ZAPATA SHELL
A		1. INITIAL ISSUE 2. ITEM 31 & 96 PL-421-11 WAS PL-346-11. 3. ITEM 32 PL-421-14 WAS PL-346-14. 6-8-77 R.W.M. 4. ZONE 8-A 'C' CLASS PENETRATION DESIGNATION ADDED. 6-9-77 R.W.M. 5. ITEM 19 PL-070-31 WAS PL-070-21 6-16-77 R.W.M. 6. ITEM 97 ADDED 6-16-77 R.W.M. 7. SECTION 9-D REVISED TO SUIT REV. 5. 6-16-77 R.W.M. 8. 39'-0 5/8" STBD. ℄ 'X' DIM. REV. X=9 WAS X=18", X=7 WAS X=21. ADDED (2) ITEM 53 & (2) ITEM 64. 6-28-77 R.W.M. 9. ZONE 9-A 1/2" REFRIG. LIQ LINE LOCATION MOVED 6" INBOARD. 7-19-77 R.W.M. 10. REV. LOC. OF CONDENSATE DRAIN IN FREEZE RM FR. 20 TO 22' & IN CHILL RM FR 10' TO 12' 11. REV LOC OF SUCTION LINE IN FAN RM 9/5 12. ADDED CONDENSATE DRAIN TO PLENUM. 13. ADDED PC #98, 99 14. REV DESCRIP. ITEM 26 & ADD ITEM 100 & REF 9 15. REV X DIM UNDER CAM. DK TO X=17" FROM SHIPS STORES 16. REV REFRIG PIPING UNDER CAMBER DK BTWN H12 & H13 TO BTWN H13 & H14, & 9 & 13" INBD 24' BHD ALSO REV X DIM BACK TO X=12 17. REV REFRIG PIPING UNDER CAMBER DK BTWN H12 & H13 TO 9" INBD 18' BHD 18. REV 4 1/8" SUCT LINE TO 9" AFT H13 19. GEN. NOTE No. 8 ADDED. 10-14-77 R.M. 20. SECTION 9-B; 24 1/2 DIM. ADDED. 21. SECTION 9-A 13, 14 & 16' DIM. ADDED 10-14-77 R.W.M. 22. SECT. 6A, 7A & PLAN VIEW, REV. "X" DIM. OF REFRIG. LIQUID & SUCTION LINES, 10'-7" & 11'-5" OFF PORT ℄. 23. ITEMS 32 & 95 REV. PL-037-01 WAS PL-092-02 24. NOTE 5 REV. 25. NOTE 9 ADDED. 26. TYPE 'K' ADDED TO DESCRIPTION OF COPPER IN PARTS LISTS. 27. SHELL, ZAPATA & N.N. APPROVALS ADDED. 28. DET. 9-B ADDED.	1-12-78	RLH		
B	7 9	1. REV. 1 5/8 O.D. TO 15" INBD OF 18' BHD PORT TO INTERFACE WITH UPPER DK 2. REV. 1 5/8, 1/2, 1 3/8 TO 9 1/4 & 1/2 O.D. TO 13 3/4" INBD 24' BHD. TO INTERFACE WITH UPPER DK.	5-8-78	A C		
C	8	1. REV. PL# ITEM 73, & ADDED ITEM 101, 102 TO L/M & DET 9.B 2. ADDED ITEM 33 & 103 TO L/M & SECT 7-A & 9-D. 3. REV PL # & DESCRIPTION ITEM 33, REV. DESCRIPTION ITEM 103 4. REV LOC OF LIQ. & SUCT LINE PENA. THRU CAM. DK TO 4'6" FWD H# APPROX 11'-0 TO PORT & 2-0 TO STBD 5. DELETED HEAT TAPE ON DRAIN LINE IN 35° CHILL ROOM. SEE ELEV 35° CHILL RM	D.W.M. 2/23/??			

AUTHORITY:

GENERAL NOTES:

1. WHEREVER POSSIBLE ALL R12 PIPING SHALL BE BENT IN LIEU OF USING ELBOWS, TO REDUCE FRICTION & NUMBER OF SOLDER JOINTS.

2. ALL R12 SCREWED CONNECTIONS TO BE MADE WITH X-PANDO OR CRANE LEAD SEAL COMPOUND. JOINTS MADE WITH THREAD COMPOUND MUST NOT THEREAFTER BE SUBJECTED TO HEAT.

3. PRELIMINARY TEST WITH R-12 AT 20 P.S.I. FINAL TEST PRESSURE 225 P.S.I. FOR HIGH SIDE AND 150 P.S.I. FOR LOW SIDE BY ADDITION OF NITROGEN OR DRY CO_2.

4. BEFORE SOLDERING OF THERMAL EXPANSION, SOLENOID, EVAPORATOR PRESSURE REGULATOR AND LINE VALVES, THE FOLLOW RECOMMENDED PRECAUTIONS TO BE USED TO PREVENT POSSIBLE DAMAGE TO VALVE COMPONENTS.
   - A. DISASSEMBLE THERMAL EXP. VALVE BY REMOVING, POWER & GAGE ASSEMBLIES & ALL GASKETS.
   - B. DISASSEMBLE SOLENOID VALVE BY REMOVING COIL, ENCLOSING THE TUBE ASSEMBLY, PLUNGER AND SPRING ASSY.
   - C. EVAPORATOR PRESS. REGULATOR - IT IS NOT NECESSARY TO DISASSEMBLE VALVE FOR INSTALLATION.
   - D. DIAPHRAM PACKLESS VALVE NEED NOT BE TAKEN APART, HOWEVER OPEN VALVE HALFWAY AND APPLY HEAT TO ONLY ONE VALVE SOCKET AT A TIME COMPLETING EACH JOINT. AFTER EACH CONNECTION IS MADE, COOL VALVE BY APPLYING A WET CLOTH ON SWAB VALVE BODY.
   - E. PACKED WING CAP VALVE - DISASSEMBLE VALVE BY REMOVING THE BONNET-STEM DISC. ASSEMBLY AND GASKET.

5. HANGERS & SUPPORTS ARE TO BE LINED WITH NEOPRENE GASKET MATERIAL AND ARE TO BE INSTALLED IN SUCH A MANNER TO PERMIT FREE EXPANSION AND CONTRACT BETWEEN ANCHORAGES & TO REDUCE VIBRATION TO A MINIMUM.

6. ALL SUCTION LINE BRANCHES SHALL BE LOOPED INTO TOP OF SUCTION MAIN TO PREVENT OIL ACCUMULATION IN LINES NOT IN SERVICE.

7. LOCATION OF THERMAL EXPANSION VALVE IS NOT TO EXCEED MORE THAN 24" FROM DISTRIBUTOR.

8. FOR INSULATION DETAILS SEE REF. # 6.

9. REFRIGERATION ARRGT., FREEZE & CHILL ROOMS. - ALL VALVE HANDWHEELS ARE TO BE COMPLETELY INSULATED TO PREVENT CONDENSATION DRIPPING FROM OVERHEAD; AND SHALL HAVE REMOVABLE COVERS FOR SERVICE.

NO.	REFERENCES	DWG NO.
9	POWER SYSTEM ARRGT. CAMBER & A DK	4100-2747
8	PLUMBING DRAINS ARRGT. & DETAILS UNDER CAMBER DK.	2500-2383
7	PLUMBING DRAINS ARRGT. & DETAILS CAMBER DECK	2500-2271
6	TYP. PIPING INSTALLATION DET. & GEN. NOTES	2502-140
5	CAMBER DECK JOINER ARRGT.	5200-61
4	"A" DECK JOINER ARRGT.	5200-62
3	DIAGRAM REFRIG. STORE ROOMS - CARRIER DWG. 580JS6006-5	
2	DIAGRAM FAN ROOM - CARRIER DWG. 580JS6 006-1	
1	VENTILATION TRUNKS & FAN ROOM ARRANGEMENT	2680-601

NNS & DD CO HULL NO.	MARAD HULL NO.
615	311
614	310
613	309

SHIPS NAME

390,000 DWT. BULK OIL CARRIER (U.L.C.C.)

APPROVALS
OWNERS ZAPATA LTR. DATED 8-25-77
SHELL LTR 1747Y DATED 8-1-77
NEWPORT NEWS LTR. 613C/615C/C2670 10-26-77
ABS N.R.
USCG N.R.

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

SCALE ___ = 1 FT.
DRAWN Ron Miller
CHECKED R.H. Salmon
SECT MGR J. T. Conquista
TECH APPROVAL
DATE COMPL. 5-4-77
EXAMINED —
AUTHORIZED A. CONLEY
DATE 1-13-78
C S D APPROVAL R.L. HARRINGTON

REFRIGERATION ARRGTS.- DECK HOUSE A/C AND REFRIGERATED STORES

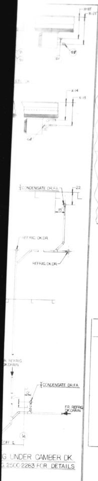
U S M A DESIGN T11-S-116a
U S M A DWG NO.
HULL NO. 613, 614, 615
DWG NO. 2670-108
REV C
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS
REMARKS
DATE
ORDERED BY DESIGN
GROUP:
NC NO.

2670-108

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

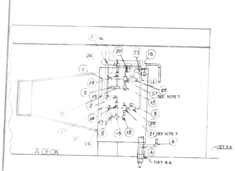
SEPT. '80
FRAME 1
10X



CONDENSATE DR. F.A.
REFRIG. DK. DR.
REFRIG. DK. DR.
CONDENSATE DR. F.A.
FR. REFRIG. DK. DRAIN

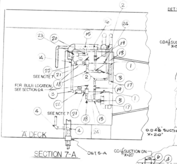
G UNDER CAMBER DK.
G. 2500-2263 FOR DETAILS

REFRIGERATION ARRGT-FAN ROOM



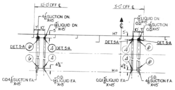
SEE NOTE 7
SEE NOTE 7
DET 5-A
DET 5-A
'A' DECK

SECTION '7-C'



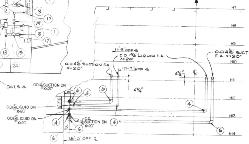
SEE NOTE 7
FOR BULB LOCATION SEE SECTION 6-A
SEE NOTE 7
'A' DECK
DET 5-A

SECTION 7-A



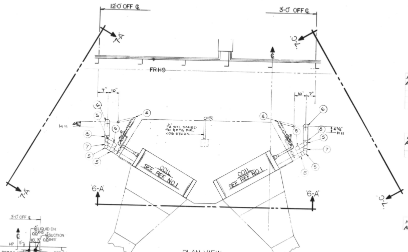
12-0" OFF ℄
3-0" OFF ℄
4 1/8" SUCTION DN. X-15"
1 1/8" LIQUID DN. X-15"
DET 5-A
O.D. 4 1/8" SUCTION FA. X-15"
O.D. 1 1/8" LIQUID FA. X-15"

CAMBER DECK



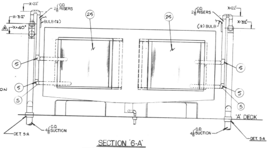
H7
H8
H9
H10
H11
H12
H13
H14
11-5" OFF ℄
O.D. 1 1/8" LIQUID F.A. X-20"
O.D. 4 1/8" SUCTION F.A. X-20"
10-7" OFF ℄
O.D. 4 1/8" SUCTION F.A. X-20"
O.D. 1 1/8" LIQUID DN. X-20"
4 1/8" SUCTION DN. X-20"
18-0" OFF ℄

PIPING UNDER CAMBER DECK



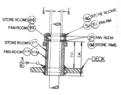
12-0" OFF ℄
3-0" OFF ℄
7-A
7-C
FR H9
1 1/2 STL SCHED 40 & FTG FR. JOB STOCK
COIL SEE REF NO. 1
COIL SEE REF NO. 1
6-A
6-A

PLAN VIEW
FAN ROOM
'A' DECK



2 1/8 O.D. RISERS
BULB (2)
(2) BULB
'A' DECK
DET 5-A
4 1/8 O.D. SUCTION

SECTION '6-A'
SUCTION LINE ONLY, SHOWN



STORE ROOMS
FAN ROOM
STORE ROOMS
FAN ROOM
STORE ROOMS
FAN RM.
FAN ROOM
STORE RMS.
DECK
3/16

DET 5-A
'NOT TO SCALE'

LIST OF MATERIAL-FAN ROOM COOLING COILS

PIPE LIST

REV	ITEM	PART NO	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
	P11	PL-534-03	1/4" O.D.	COPPER TUBE TYPE 122	COPPER	ASTM-B-280	1/4" O.D. X .030 WALL
	P12	PL-500-05	3/4"	SEAMLESS COPPER TUBE	TYPE "K" (HARD)	ASTM-B-88	.875 O.D. X .065 WALL
	P13	06	1"	↓	↓	↓	1.125 O.D. X .065 WALL
	P14	08	1 1/2"	↓	↓	↓	1.625 O.D. X .072 WALL
	P15	09	2"	↓	↓	↓	2.125 O.D. X .083 WALL
	P16	13	4"	↓	↓	↓	4.125 O.D. X .134 WALL
	P17	FROM STOCK	3"	SEAMLESS COPPER TUBE	COPPER	ASTM-B-88	3.125 O.D. X .109 WALL
	P18	PL-062-50	3"	STEEL NIPPLE 3" LG.	SCH. 40	ASTM-A-53	
	P19	PL062-51	5"	STEEL NIPPLE 3" LG.	SCH. 40	ASTM-A-53	

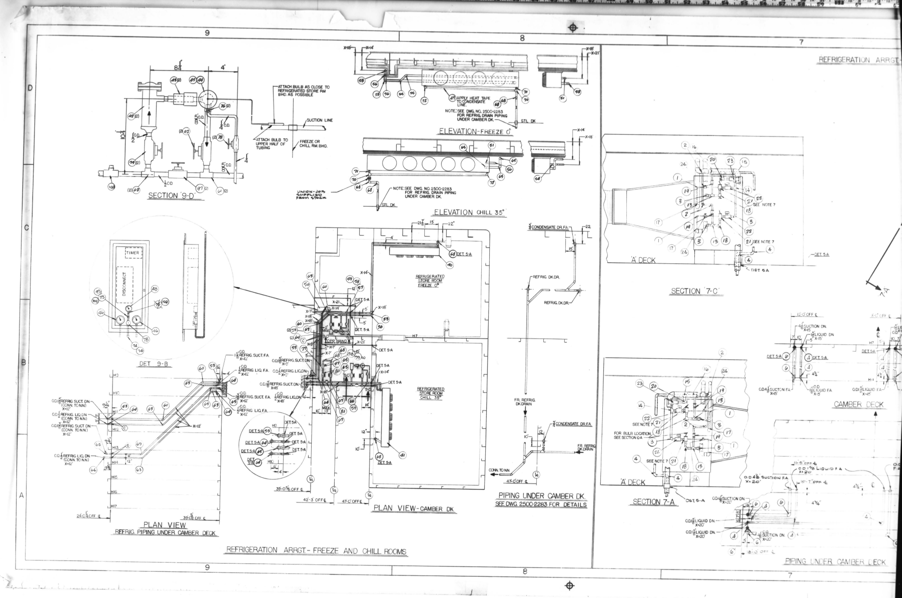
MATERIAL LIST

	REV	ITEM	PART NO	SIZE	DESCRIPTION	MATERIAL	SPEC	REMARKS
		1	PL-062-02	1/4" O.D.	ELBOW 90° CXC	WROT COPPER	ANSI-B-16.22	MUELLER #W-2715 OR EQUAL
NOMINAL SIZE SHOWN ADD 1/8" FOR O.D. SIZE		2	PL-537-12	3/4"	↓	↓	↓	NIBCO # 607 OR EQUAL
↓		3	16	1"	↓	↓	↓	↓
↓		4	23	1 1/2"	↓	↓	↓	↓
↓		5	25	2"	↓	↓	↓	↓
↓		6	30	4"	↓	↓	↓	↓
		7	PL-565-18	3"x2"	ELBOW 90° CXC	CAST BRONZE	ANSI-B-16.18	NIBCO #707 OR EQUAL
		8	PL-548-05	4"x3"x2"	TEE, REDUCING CXCXC	WROT COPPER	ANSI-B-16.22	NIBCO #611 OR EQUAL
		9	PL-149-64	1 5/8 O.D. COPPER TUBE	STEEL SLEEVE SEE ITEM #10 FOR MATERIAL ORDERED	STEEL TUBING	GR. 1015	2 1/8 O.D. X .247 WALL
		10	PL-149-14	2 1/8 O.D. X .250W.	STEEL TUBING	STEEL TUBING	GR. 1015	2 1/8 O.D. X .250 WALL
		11	PL-149-72	4 1/8 O.D. COPPER TUBE	STEEL SLEEVE SEE ITEM #12 FOR MATERIAL ORDERED	STEEL TUBING	GR. 1015	4 5/8 O.D. X .247 WALL
		12	PL-149-22	4 5/8 O.D. X .250W.	STEEL TUBING	STEEL TUBING	GR. 1015	4 5/8 O.D. X .250 WALL
NOMINAL SIZE SHOWN ADD 1/8" FOR O.D. SIZE		13	PL-546-78	1"x1"x3/4"	TEE REDUCING CXCXC	WROT COPPER	ANSI-B-16.22	NIBCO #611 OR EQUAL
↓		14	PL-547-23	1 1/2x1"x1"	TEE REDUCING CXCXC	WROT COPPER	ANSI-B-16.22	NIBCO #611 OR EQUAL
↓		15	PL-547-10	1 1/2 x 1 1/2 x 1 1/2	TEE REDUCING CXCXC	WROT COPPER	ANSI-B-16.22	NIBCO #611 OR EQUAL
		16	PL-547-29	1 1/2 x 3/4 x 3/4	TEE REDUCING CXCXC	WROT COPPER	ANSI-B-16.22	NIBCO #611 OR EQUAL
		17	PL-062-01	1/4" O.D.	COUPLING ROLLED STOP	WROT COPPER	ANSI-B-16.22	MUELLER #W-1003 OR EQUAL
		18	PL-070-20	1 1/8 O.D.	ANGLE VALVE CXC	CAST BRONZE	MIL-V-2006AE	MUELLER #A-15165 OR EQUAL
		19	PL-070-31	7/8 O.D.	GLOBE EXPANSION VALVE CXC	CAST BRONZE	MIL-V-2006AE	HENRY VALVE # 6297
		20	PL-070-22	1 5/8 O.D.	ANGLE VALVE CXC	CAST BRONZE	MIL-V-2006AE	MUELLER # A-15167 OR EQUAL
FURN. BY N.N.		21	PL-050-15	1 1/8 O.D.	THERMAL EXP. VALVE TYPE THR 45FW ALCO FURNISHED BY CARRIER W/UNIT			
FURN. BY N.N.		22	PL-050-16	1 1/8 O.D.	SOLENOID VALVE #230RA16S9-M ALCO FURNISHED BY CARRIER W/UNIT			
FURN. BY N.N.		23	PL-050-17	1 3/8 O.D.	STRAINER # 8766 HENRY FURNISHED BY CARRIER W/UNIT			
		24	PL-070-23	1/4" O.D.	LINE VALVE CXC	CAST BRONZE	MIL-V-2006AE	MUELLER # A-15580 OR EQUAL
FURN. BY N.N.		25	PL-050-18		COOLING COILS AEROFIN 1-L.H. & 1-R.H. FURNISHED BY CARRIER W/UNIT			
FURN. BY N.N.		26	SEE REF 9		TEMP. CONTROL SWITCH DETROIT FURNISHED BY CARRIER W/UNIT			
NOMINAL SIZE SHOWN ADD 1/8" FOR O.D. SIZE		27	PL-543-09	1 1/2"	ELBOW 45° CXC	WROT COPPER	ANSI-B-16.22	NIBCO # 606 OR EQUAL
		28	PL-543-14	4"	ELBOW 45° CXC	WROT COPPER	ANSI-B-16.22	NIBCO # 606 OR EQUAL
		29	PL-092-01		INSULATING RING - COMPRESSED ASBESTOS			COMMERCIAL
		30	PL-421-14	5"	SCREWED CAP FOR 5" I.P.S. PIPE	150#	ASTM-A-197	FLAGG No. 1045 OR EQUAL
		31	PL-421-11	3"	SCREWED CAP FOR 3" I.P.S. PIPE	150#	ASTM-A-197	FLAGG No. 1045 OR EQUAL
		32	PL-037-01	1/4" TK.	NEOPRENE GASKET	MATERIAL		JOB TO LOCATE AS REQD.
		33	PL062-12	1/4"	ACCESS VALVE 5/16 O.D. TUBE OR 1/4 O.D. 5/16 SOLDER	BRASS		

2670-108

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 2
10X


9
8
7
D
C
B
A
SECTION '9-D'
ATTACH BULB AS CLOSE TO REFRIGERATED STORE RM BHD. AS POSSIBLE
SUCTION LINE
ATTACH BULB TO UPPER HALF OF TUBING
FREEZE OR CHILL RM. BHD.
ELEVATION-FREEZE 0°
APPLY HEAT TAPE TO CONDENSATE LINE.
NOTE: SEE DWG. NO. 2500-2283 FOR REFRIG. DRAIN PIPING UNDER CAMBER DK.
STL. DK
UNION-JOB SUPPLIED FROM STOCK
ELEVATION CHILL 35°
DET 9-B
TIMER
DISCONNECT
REFRIGERATED STORE ROOM FREEZE 0°
REFRIGERATED STORE ROOM CHILL 35°
DET 5-A
OPR. HAND
PLAN VIEW-CAMBER DK.
39-0 5/8 OFF ℄
42-3 OFF ℄
47-0 OFF ℄
¾ CONDENSATE DR. F.A.
REFRIG. DK.DR.
FR. REFRIG. DK.DRAIN
CONN. TO N.N.
PIPING UNDER CAMBER DK.
SEE DWG. 2500-2283 FOR DETAILS
PLAN VIEW
REFRIG. PIPING UNDER CAMBER DECK
O.D. REFRIG. SUCT. DN (CONN. TO N.N.) X-12
O.D. REFRIG. LIQ. DN (CONN. TO N.N.) X-12
O.D. REFRIG. SUCT. F.A.
O.D. REFRIG. LIQ. F.A.
24-0 ¼ OFF ℄
39-0 5/8 OFF ℄
REFRIGERATION ARRGT-
SECTION '7-C'
'A' DECK
SEE NOTE 7
DET 5-A
SECTION 7-A
FOR BULB LOCATION SEE SECTION 6-A
CAMBER DECK
SUCTION DN.
LIQUID DN.
SUCTION F.A.
LIQUID F.A.
PIPING UNDER CAMBER DECK

REFRIGERATION ARRGT.- FREEZE AND CHILL ROOMS

2670 - 108

MICRO-MASTER 105 mm

K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 3

2960-100

CSD VAULT

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APP'D.
~	~	SEE SHEET 2	~	~	~	~

REV. STATUS OF SHEETS

REV.	D	D	C	D	C
SHEET	1	2	3	4	5

GROUP

MC NO.

DWG. REV. — HULL APPLIC.

REV.	NN HULLS ONLY 613c	614c	615c
A	Yes	Yes	Yes
B	YES	YES	YES
C	YES	YES	NO
D	YES	YES	NO

NNS & DD Co. HULL NO.	MARAD HULL NO.	USMA DESIGN	SHIP'S NAME
615c 614c 613c	611 610 609	T11-S-116a	

APPROVALS

OWNERS SHELL TRANS NO. 1937V DATED 3-9-78

ABS NR

USCG NR

Newport News Shipbuilding
A Tenneco Company

TENNECO

FSCM NO. 43689

Commercial Ship Division

COMMERCIAL DESIGN DIVISION DEPT. E13

COMPLETE ISSUE ☒

PARTIAL ISSUE ☐

GROUP SHTS SEE DWG 6960-140

SCALE: NONE = 1 Ft.
DRAWN: G.L. BROWN
CHECKED: J H Johnson
SECT. MGR.

DATE COMPL. 9-2-77
EXAMINED: ~
AUTHORIZED: A. Conley
DATE 9-2-77

TECH. APPROVAL NR

CSD APPROVAL R.L. Harrington

TITLE LABEL PLATES FOR SERVICE STEAM SYSTEM (OUTSIDE MACHY SPACE & DECK HOUSE)

DWG. NO. 2960-100

REVISION D

SHEET NO. 1 OF 5

DATES: GROUPED BY, CHK. — COMP. — PART

HULL 613C GROUP NO. KEY

TYPE OF DWG.

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING YES
REMARKS REV. D

DATE 10-4-78 SIGNED J McCauley

SPECIAL PRINTS

REV.	DATE ISSUED
A	9-9-77
B	2-9-78
C	9-7-78
D	10-12-78

YARD PRINTS

FIRST ISSUE	DEPT.	NO. PRINTS
	AH	
	BL	
	BR	
	EL	
	FP	
9-9-77	MI	4
	ML	
	MS	
	PC	
	PM	
9-9-77	PS	12
	PN	
	RD	
	RM	
	MIR	
	SH	
	SM	
	TM	
	WD	
	WE	
	WM	
	X16	
9-9-77	RO	1

ORDERED BY DESIGN

FIRST ISSUE	DEPT.	NO. PRINTS
9-9-77	SEPIA/RO	
↓	CSD-V	
	KSD	
	JEA	
2-9-78	MAL RM	4

M7 11 X 17

2960-100

MICRO-MASTER 105 mm

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4X

REVISIONS

COST CHG NO.		REV	SH NO.	LINE NO.	DESCRIPTION	NNS&DD CO		OWNERS	
NN	OWNR					DATE	AUTHD	DATE	APPD
~	~	A	1-4	all	INITIAL ISSUE	9/2/7	JKJ		
		B	-	-	ADDED GROUP NO TO SHT 4	1/23/8	JKJ		
-	-	C	1	-	"COMPLETE/PARTIAL" ISSUE BLOCK ADDED. OWNER APPROVAL LETTER DATE ADDED. TITLE OF DRAWING CHANGED TO AGREE WITH LABEL PLATE APPLICATIONS.				
			2		TITLE AT BOTTOM OF SHEET MODIFIED.				
			3		SHEET NUMBERS CHANGED UNDER "LIST" IN "TABLE OF CONTENTS". TITLE AT BOTTOM OF SHEET MODIFIED.				
			4	ALL	LINES MODIFIED THROUGHOUT.				
			5	-	NEW SHEET ADDED. DWM	8/28/78			
-	-	D	4	1,2, 3,4, 5,6, 7,8, 9,10, 11,12, 15,16,	UNDER INSCRIPTION, COLUMN 10, "COV" CHANGED TO "C.O." TO SUIT SHELL TRANS NO 2102Y DATED 10-2-78 DWM	10-4-78			

COST CHG NO.		REV	SH NO.	LINE NO.	DESCRIPTION	NNS&DD CO		OWNR'S	
NN	OWNR					DATE	AUTHD	DATE	APPD

LABEL PLATES-SERVICE STM. SYS (OUTSIDE MACHY RM AND DK HOUSE)	HULL NO. 613c, 614c, 615c	DWG. NO. 2960-100	REV. D
			SHEET 2

K&E 19 1253 10-71 2236•

NN11-11 X 17 (REV. 1)

2960-100

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4X

TABLE OF CONTENTS

SH NO.	TITLE
1	TITLE SHEET
2	REVISIONS
3	TABLE OF CONTENTS
4	LIST
5	LIST

REFERENCES

NO.	TITLE		DWG NO.
1	LABEL PLATE STANDARDS (MERCHANT VESSELS)		213388

LABEL PLATES-SERVICE STM SYS (OUTSIDE MACHY RM AND DECKHOUSE)	HULL NO. 613C, 614C, 615C	DWG. NO. 2960-100	REV. C
			SHEET 3

K&E 19 1253 10-71 2236•

MN12-11 X 17 (REV. 1)

2960-100

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1 PRINTS	2 NO. PC.	3 DET REF. NO. MISC MATL & THK	4 DET REF. NO. MISC WIDTH	5 DET REF. NO. MISC LETTERS TYPE	6 DET REF. NO. MISC LETTERS SIZE	7 DET REF. NO. SH. NO.	8 DET REF. NO. VALVES ITEM NO.	9 DET REF. NO. VALVES MATL & THK	10 INSCRIPTION	11 MATL. SOURCE	12 REMARKS	13 ATTACH CLASS DWG NO. SHEET	14 ARR DWG NO.	15 ITEM OR ASSY TO BE LABELED	16 DECK	17 FR	18 CL OR DIM P OR S	19 COMPT	20 MATERIAL RECORD	21 LINE NO.	22 REV
	1	~	~	N	1/8	28	5	SEN AL .032	STM C.O. CONV NO 1	S		H 8	2652-254	V-1	78'-4 LEV	18	P	BOSN STRM		1	D
	1	~	~						STM C.O. CONV NO 2					V-2		10				2	D
	1	~	~						STM C.O. CONV NO 3					V-3		2				3	D
	1	~	~						STM C.O. CONV NO 4				↓	V-4	↓	-6	↓	↓		4	D
	1	~	~						STM C.O. CONV NO 5				2652-257	V-5	UPPER DK	37½	S	DECK MAINT SHOP		5	D
	1	~	~						DR C.O. CONV NO 1				2652-254	V-7	78'-4 LEV	20	P	BOSN STRM		6	D
	1	~	~						DR C.O. CONV NO 2					V-8		12				7	D
	1	~	~						DR C.O. CONV NO 3					V-9		4				8	D
	1	~	~						DR C.O. CONV NO 4				↓	V-10	↓	-4	↓	↓		9	D
	1	~	~				↓		DR C.O. CONV NO 5				2652-257	V-11	UPPER DK	37½	S	DECK MAINT SHOP		10	D
	1	~	~				7		STM C.O. UNIT HTR NO 1				2652-254	V-19	78'-4 LEV	8½	P	STEERING GEAR ROOM		11	D
	1	~	~	↓	↓	↓	5	↓	DR C.O. UH NO 1			↓		V-20		7½	P			12	D
	1	SEN AL .02	1½	R	3/8 3/8	17	~	~	V21 TEMPERATURE REGULATOR FOR UNIT HEATER NO. 1			M 8	↓	PIPE ADJACENT TO VALVE V21	↓	8	P	↓		13	C
	1	↓	↓	↓	↓	↓	~	~	V25 TEMPERATURE REGULATOR FOR PREHEATER NO. 4			↓	2652-257	PIPE ADJACENT TO VALVE V25	UPPER DK	30	P	EMER DIESEL GEN RM		14	C
	1	~	~	N	1/8	28	5	SEN AL .032	STM C.O. PHR NO 4			H 8		V-29		30½	P			15	D
	1	~	~	↓		↓	↓	↓	DR C.O. PHR NO 4			↓		V-33		↓	P			16	D
	1	SEN AL .02	5/8	R	↓	17	~	~	AIR VENT PHR NO. 4	↓		M 8	↓	PIPE ADJACENT TO VALVE V41	↓	29	P	↓		17	C

ROUTING	CONTROL NO. SHOP	CONTROL NO. ERECTION	GROUP NO.		DRAWN	DATE	N N DRAWING NO.	HULL NO.	SHEET NO.	REV
RO-PS			2652-2301-1001SI	LABEL PLATE LIST SERVICE STEAM SYS (OUTSIDE MACHY RM AND DECKHOUSE)	GLB		2960-100	613C 614C 615C	4	D
					CHK	APPD·				

K&E 19 1293 2-72 2293•

MN22B (REV. 1) (11X17)

2960-100

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4X

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		DET REF. NO.																			
		MISC					VALVES														
				LETTERS																	
PRINTS	NO. PC.	MATL & THK	WIDTH	TYPE	SIZE	SH. NO.	ITEM NO.	MATL & THK	INSCRIPTION	MATL. SOURCE	REMARKS	ATTACH CLASS DWG NO. SHEET	ARR DWG NO.	ITEM OR ASSY TO BE LABELED	DECK	FR	CL OR DIM P OR S	COMPT	MATERIAL RECORD	LINE NO.	REV
	1	SEN AL .02	7/8	R	3/8	17	–	–	STM CONVECTOR NO. 1	S		2 8	2652 254	CONVECTOR CASING	78'-4 LEV	18 TO 20	P	BOSN STRM		1	C
	1						–	–	2							10 TO 12				2	C
	1						–	–	3							2 TO 4				3	C
	1						–	–	4							-6 TO -4				4	C
	1						–	–	5				2652 257		UPPER DK	36½ TO 37½	S	DECK MAINT SHOP		5	C
	1						–	–	UNIT HEATER NO. 1				2652 254	UNIT HTR	78'-4 LEV	6½	P	STEERING GEAR RM		6	C

ROUTING	CONTROL NO. SHOP	CONTROL NO. ERECTION	GROUP NO.		DRAWN	DATE	N N DRAWING NO.	HULL NO.	SHEET NO.	REV
			2652-2301-1001 SI	LABEL PLATE LIST SERVICE STM (OUTSIDE MACHY SP & DECKHOUSE	DWM		2960-100	613C 614C	5	C
					CHK	APPD				

K&E 19 1253 11-74 W2974•

MN22B (REV. 1) (11X17)

2960-100

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CSD VAULT 2960-123

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APP'D.

REV. STATUS OF SHEETS										
REV.	D	D	B	D	D	D	D	D	D
SHEET	1	2	3	4	5	6	7	8	9

GROUP

MC NO.

DWG. REV. — HULL APPLIC.

REV.	NN HULLS ONLY 613c	614c			
A	Yes	Yes			
B	Yes	Yes			
C	YES	YES			
D	Yes	Yes			

NNS & DD Co. HULL NO.	MARAD HULL NO.	USMA DESIGN	SHIP'S NAME
614c 613c	310 309	T11-S-116A	

APPROVALS

OWNERS

ABS NR

USCG NR

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING DEPT.

GROUP SHTS/ SEE DWG 6960-140

SCALE: NONE =1 Ft.
DRAWN: G.L. BROWN
CHECKED: J.G. BOYCE
SECT. MGR. L.W. Croswell

DATE COMPL. 11-15-77
EXAMINED: —
AUTHORIZED: A. Conley /Rw
DATE 11-15-77

TECH. APPROVAL NR

CSD APPROVAL R. L. Harrington

TITLE LABEL PLATES FOR STEAM & EXHAUST SYSTEM (OUTSIDE MACH'Y SPACE)

DWG. NO. 2960-123

REVISION D

SHEET NO. 1 OF 8

M7 11 X 17

REPRODUCTION OFFICE

YARD PRINTS YES GROUPING ~
REMARKS REV "D"

DATE 10-19-78 SIGNED L.W. Croswell

	FIRST ISSUE	DEPT.	NO. PRINTS		REV.	DATE ISSUED	SPECIAL PRINTS
YARD PRINTS		AH			A	11-21-77	
		BL			B	3-15-78	
		BR			C	6-6-78	
		EL			D	10-24-78	
	3-15-78	061c	1				
	11-21-77	MI	4				
		ML					
	11-21-77	MS	2				
		PC					
		PM					
	11-21-77	PS	12				
		PN					
		RD					
		RM					
		MIR					
		SH					
		SM					
		TM					
		WD					
		WE					
		WM					
		X16					
ORDERED BY DESIGN	11-21-77	LWC	1				
	↓	CSD-V	1				
		KSD	1				
		MAIL	X				
	↓	RO/SEPIA	1				

TYPE OF DWG.	HULL 613c		DATES		GROUPED	
	KEY	GROUP NO.	PART	COMP.	BY	CHK.

2960-123

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REVISIONS

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		OWNER	
NN	OWNER					DATE	AUTHD	DATE	APPD
~	~	A	1-7	all	INITIAL ISSUE	—	—	—	—
~	~	B	8	all	ADDED JWS	2/28/78	LWC		
~	~	C	4-8	all	ADDED GROUP NO. TO SHT^{s} 4-8 KSN.	5/26/78	LWC		
			9	all	ADDED AES				
~	~	D	ALL 9	 2-11	REVISED TO SUIT DESIGN DEVELOPMENT ADDED JMN^{JGB}	10/19/78	LWC	11/15/78	Shell 2157V

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		OWNER	
NN	OWNER					DATE	AUTHD	DATE	APPD

LABEL PLATES-STM & EXH SYS-OUTSIDE MACHY SPACE	HULL NO. 613c, 614c	DWG. NO. 2960-123	REV. D
			SHEET 2

K&E 19 1253 10-71 2236•

NN11-11 X 17 (REV. 1)

2960-123

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SEPT. '80

4X

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SH NO.	TITLE
1	TITLE SHEET
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REFERENCES		
NO.	TITLE	DWG NO.
1	LABEL PLATE STANDARDS (MERCHANT VESSELS)	213388

LABEL PLATES-STM & EXH SYS - OMS	HULL NO. 613c, 614c	DWG. NO. 2960-123	REV. B
			SHEET 3

K&E 19 1253 10-71 2236•

NN12-11 X 17 (REV. 1)

2960-123

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4X

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		DET REF. NO. 1										REF 1									
		MISC					VALVES														
				LETTERS																	
PRINTS	NO. PC.	MATL & THK	WIDTH	TYPE	SIZE	SH. NO.	ITEM NO.	MATL & THK	INSCRIPTION	MATL. SOURCE	REMARKS	ATTACH CLASS DWG NO. SHEET	ARR DWG NO.	ITEM OR ASSY TO BE LABELED	DECK	FR	CL OR DIM P OR S	COMPT	MATERIAL RECORD	LINE NO.	REV
	1	AL. .032	5/8	R	1/8	17	—	—	V-150 DESUP. ST STRIP. PMP	S	BACK PLT. DET. "34" ATT. TO CONT'L. AIR PIPING	DD 8A	6450-679		15'-6 ABL	59 2/3	P	CARGO PUMP ROOM		1	D
	1	—	—			28	16	BRASS .05	V-179 DK WINCH ST			H 8	6450-784		UPPER	14	P	—		2	
	1	—	—						V-180							6	S	—		3	
	1	—	—						V-181				↓			14	S	—		4	
	1	—	—						V-182				6450-773			63 1/3	P	—		5	
	1	—	—						V-183				↓			67 1/2	P	—		6	
	1	—	—						V-184				6450 777			99 1/3	P	—		7	
	1	—	—						V-185				↓			97	S	—		8	
	1	—	—						V-186 ↓				6450-784			7	P	—		9	
	1	—	—						V-188 COMB WINCH & WINDLASS ST				6450-779			109	P	—		10	
	1	—	—						V-189 ↓							113	S	—		11	
	1	—	—			↓	↓	↓	V-190 DK WINCH ST			↓	↓		↓	125 1/2	S	—		12	
	1	AL .032	5/8			17	—	—	V-275 STRIP. PMP EXH		BACK.PLT DET. "34" ATT. TO CONT'L AIR PIPING	DD 8A	6450-679		13'-3" ABL	59 2/3	P	CARGO PUMP ROOM		13	
	1	—	↓			28	17	BRASS .05	V-291 DK WINCH EXH			H 8	6450-779		UPPER	126	S	—		14	
	1	—	—						V-292 COMB. WINCH & WINDLASS EXH							112 1/2	S	+		15	
	1	—	—						V-293 ↓				↓			110	P	—		16	
	1	—	—						V-294 DK WINCH EXH				6450-777			99 1/2	P	—		17	
	1	—	—	↓	↓	↓	↓	↓	V-295 ↓	↓		↓	6450-773		↓	67 1/2	P	—		18	↓

ROUTING	CONTROL NO. SHOP	CONTROL NO. ERECTION	GROUP NO. 6450-2301-1005 SI	LABEL PLATE LIST FOR STM & EXH SYS OUTSIDE MACHY SPACE	DRAWN GLB CHK JGB	DATE 11-15-7 APPD LWC.	N N DRAWING NO. 2960-123	HULL NO. 613 C 614 C
								SHEET NO. 4
								REV D

K&E 19 1283 2-72 2293+

MN22B (REV. 1) (11X17)

2960-123

MICRO-MASTER® 105 mm

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		DET REF. NO.																			
		MISC					VALVES														
				LETTERS																	
PRINTS	NO. PC.	MATL & THK	WIDTH	TYPE	SIZE	SH. NO.	ITEM NO.	MATL & THK	INSCRIPTION	MATL. SOURCE	REMARKS	REF I ATTACH CLASS DWG NO. SHEET	ARR DWG NO.	ITEM OR ASSY TO BE LABELED	DECK	FR	CL OR DIM P OR S	COMPT	MATERIAL RECORD	LINE NO.	REV
	1	—	—	R	1/8	28	17	BRASS .05	V-296 DK WINCH EXH	S		H 8	6450-773		UPPER	63½	P	—		1	D
	1	—	—						V-297				6450-777			97	S	—		2	
	1	—	—						V-298				6450-784			8	P	—		3	
	1	—	—						V-300							15		—		4	
	1	—	—						V-301							6	S	—		5	
	1	—	—						V-302							15		—		6	
	1	—	—	N			8		V-433 HTG COIL DR TRAP C.O.				6450-773			58⅓		—		7	
	1	—	—						V-434							58¼		—		8	
	1	—	—						V-435 HTG COIL TRAP BYP							58⅓		—		9	
	1	—	—						V-487 ST TO HTG COIL							58½		—		10	
	1	—	—	R			4		V-513P DK ST MAIN WARM-UP				6450-779			112½	P	—		11	
	1	—	—						V-513S							126	S	—		12	
	1	—	—						V-516				6450-784		78'-4" FLAT	12		—		13	
	1	—	—	N			1		V-528 SAMP CONN				6450-773			58½		—		14	
	1	—	—				8		V-545 ST-PORT. GAS FREE. BLOWER							62	P	—		15	
	1	—	—						V-546							65¾		—		16	
	1	—	—						V-547							69½		—		17	
	1	—	—						V-548				6450-775			73½		—		18	

ROUTING	CONTROL NO. SHOP	CONTROL NO. ERECTION	GROUP NO. 6450-2301 1005 SI	LABEL PLATE LIST FOR STM & EXH SYS OUTSIDE MACHY SPACE	DRAWN SMN	DATE	N N DRAWING NO. 2960-123	HULL NO. 613C 614C	SHEET NO. 5	REV D
					CHK	APPD·				

K&E 19 1253 11-74 W2974•

MN22B (REV. 1) (11X17)

2960-123

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

® Registered trade mark of KEUFFEL & ESSER CO.

SEPT. '80

4X

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		DET REF. NO. / MISC					VALVES														
				LETTERS																	
PRINTS	NO. PC.	MATL & THK	WIDTH	TYPE	SIZE	SH. NO.	ITEM NO.	MATL & THK	INSCRIPTION	MATL. SOURCE	REMARKS	REF 1 ATTACH CLASS DWG NO. SHEET	ARR DWG NO.	ITEM OR ASSY TO BE LABELED	DECK	FR	CL OR DIM P OR S	COMPT	MATERIAL RECORD	LINE NO.	REV
	1	—	—	N	1/8	28	8	BRASS .05	V-549 ST-PORT. GAS FREE. BLOWER	5		H 8	6450-775		UPPER	77½	P	—		1	D
	1	—	—						V-550							81½		—		2	
	1	—	—						V-551							85½		—		3	
	1	—	—						V-552				6450-777			89¼		—		4	
	1	—	—						V-553							93¼	S	—		5	
	1	—	—						V-554							97¼	P	—		6	
	1	AL .032	5/8			17	—	—	V-911 CARGO TK CLG HTR DR LVL CONT		HOLES REQ'D, ATTACH TO VALVE YOKE	W 8	6450-679		52'-6" LVL	58	S	PUMP ROOM		7	
	1	—	—			28	16 MOD.	AL .032	V-912 INLET		DRILL 1 5/16 I.D.	H 8								8	
	1	—	—						V-913 OUTLET											9	
	1	—	—				14		V-914 BY-PASS											10	
	1	—	—				4		V-1131 RESERVOIR C.O.								℄			11	
	1	—	—						V-1132 PILOT C.O.											12	
	1	—	—						V-1133 RESERVOIR FILL											13	
	1	—	—				16 MOD.		V-4004 DESUP. ST TO TK CLN HTR		DRILL 2 1/8 I.D.						S			14	
	1	—	—				8	BRASS .05	V-5000 ST-PORT. GAS FREE. BLOWER				6450-777		UPPER	101¼	P	—		15	
	1	—	—						V-5001				6450-779			105		—		16	
	1	—	—				4		V-5053 DK ST MAIN WARM-UP				6450-784		78'-4" FLAT	10		—		17	
	1	-	—						V-5054 DK ST MAIN DR							10		—		18	

ROUTING	CONTROL NO. SHOP	CONTROL NO. ERECTION	GROUP NO.		DRAWN	DATE	N N DRAWING NO.	HULL NO.	SHEET NO.	REV
			6450-2301-1005 SI	LABEL PLATE LIST FOR STM & EXH SYS OUTSIDE MACHY SPACE	GLB	11-15-77	2960-123	613c 614c	6	D
					CHK JGB	APP'D LWC				

K&E 19 1253 2-72 2293•

MN22B (REV. 1) (11X17)

2960-123

MICRO-MASTER® 105 mm

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		DET REF. NO.																			
		MISC					VALVES														
				LETTERS																	
PRINTS	NO. PC.	MATL & THK	WIDTH	TYPE	SIZE	SH. NO.	ITEM NO.	MATL & THK	INSCRIPTION	MATL. SOURCE	REMARKS	ATTACH CLASS DWG NO. SHEET	ARR DWG NO.	ITEM OR ASSY TO BE LABELED	DECK	FR	CL OR DIM P OR S	COMPT	MATERIAL RECORD	LINE NO.	REV
	1	—	—	R	1/8	28	4	BRASS .05	V-5055 DK ST MAIN DR	S		H 8	6450-784		78'-4" FLAT	12	S	—		1	D
	1	—	—	↓	↓	↓	16	↓	V-5056 COMB. WINCH & WINDLASS ST	↓		↓	6450-779		UPPER DK	112½	P	—		2	↓
	1	—	—	↓	↓	↓	↓	↓	V-5057 ↓	↓		↓	↓		↓	110	S	—		3	↓
	1	—	—	↓	↓	↓	17	↓	V-5058 COMB. WINCH & WINDLASS EXH	↓		↓	↓		-	113	P	—		4	↓
	1	—	—	↓	↓	↓	↓	↓	V-5059 ↓	↓		↓	↓		↓	110	S	—		5	↓
	1	—	—	↓	↓	↓	11	AL .032	V-5004 ST. OUT SEA CHEST	↓		↓	6000-314		BEL. 15'-0" LVL	60	14'-5" OFF ℄ P	PUMP ROOM		6	↓
	1	—	—	↓	↓	↓	↓	↓	V-5005 ↓	↓		↓	↓		↓	↓	14'-5" OFF ℄ S	↓		7	↓
	1	—	—	↓	↓	↓	↓	↓	V-5006 ↓	↓		↓	↓		↓	↓	28'-4" OFF ℄ S	↓		8	↓
	1	—	—	↓	↓	↓	4	BRASS .05	V-5073 OIL/WTR SEP. ST	↓		↓	6450-773		UPPER DK	58	P	—		9	↓
	1	—	—	↓	↓	↓	↓	↓	V-5074 ↓ DR	↓		↓	↓		↓	↓	↓	—		10	↓

ROUTING	CONTROL NO. SHOP	CONTROL NO. ERECTION	GROUP NO.	TITLE	DRAWN / CHK	DATE / APPD	N N DRAWING NO.	HULL NO.	SHEET NO.	REV
			6450-2301-1005 SI	LABEL PLATE LIST FOR STM & EXH SYS OUTSIDE MACHY SPACE	GLB JGB	11-15-77 LWC.	2960-123	613C 614C	7	D

K&E 19 1253 2-72 2293•

MN22B (REV. 1) (11X17)

2960-123

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
PRINTS	NO. PC.	DET REF. NO. MISC MATL & THK	WIDTH	LETTERS TYPE	LETTERS SIZE	SH. NO.	VALVES ITEM NO.	VALVES MATL & THK	INSCRIPTION	MATL. SOURCE	REMARKS	REF 1 ATTACH CLASS DWG NO. SHEET	ARR DWG NO.	ITEM OR ASSY TO BE LABELED	DECK	FR	CL OR DIM P OR S	COMPT	MATERIAL RECORD	LINE NO.	REV
	1	—	—	R	1/8	28	9	SEN. AL. .032	V-5047 ST TO SLOP TK *12 P HTG COIL NO. 1A	S		H 8	6450-679		15'-0 LVL	61	29'-3 P	CARGO PUMP ROOM		1	D
	1	—	—						V-5048 ST TO SLOP TK *12 P HTG COIL NO. 1B								28'-0 P			2	
	1	—	—						V-5049 ST TO SLOP TK *12 P HTG COIL NO. 2A								26'-6 P			3	
	1	—	—						V-5050 ST TO SLOP TK *12 P HTG COIL NO. 2B								25'-0 P			4	
	1	—	—						V-5051 ST TO SLOP TK *12 P HTG COIL NO. 3A								23'-9 P			5	
	1	—	—				↓		V-5052 ST TO SLOP TK * 12 P HTG COIL NO. 3B						↓	↓	22'-6 P			6	
	1	—	—				6		V1489 CYL. DR						8'-0 LVL	59½	37'-0 P			7	
	1	—	—						V1490							↓				8	
	1	—	—						V1491							59¾				9	
	1	—	—			↓	↓	↓	V1492 ↓			↓								10	
	1	AL .032	5/8			17	—	—	V1493 CYL. DR-REMOTE OP		BACK. PLT. DET. "34A"	DD 8A				↓				11	
	1	↓	↓	↓	↓	↓	—	—	V1520 ↓	↓	↓	↓	↓		↓	59½	↓	↓		12	↓

ROUTING	CONTROL NO. SHOP	CONTROL NO. ERECTION	GROUP NO.		DRAWN	DATE	N N DRAWING NO.	HULL NO.	SHEET NO.	REV
			6450-2301 1005 SI	**LABEL PLATE LIST** FOR STM & EXH SYS. OUTSIDE MACHY SPACE	JMN CHK	APPD.	2960-123	613C 614C	8	D

K&E 19 1253 11-74 W2974•

MN22B (REV. 1) (11X17)

2960-123

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SEPT. '80

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		DET REF. NO.																			
		MISC					VALVES														
				LETTERS																	
PRINTS	NO. PC.	MATL & THK	WIDTH	TYPE	SIZE	SH. NO.	ITEM NO.	MATL & THK	INSCRIPTION	MATL. SOURCE	REMARKS	REF ATTACH CLASS DWG NO. SHEET	ARR DWG NO.	ITEM OR ASSY TO BE LABELED	DECK	FR	CL OR DIM P OR S	COMPT	MATERIAL RECORD	LINE NO.	REV
	1	SEN. AL .02	2 1/4	R	1/2 1/4 1/4 1/4	19	—	—	CAUTION CRACK V-1133 BEFORE FILLING RESERVOIR TO ENSURE STEAM IS NOT PRESENT	S	ATTACH TO BHD 58 ADJ. TO F-3	X 8	6450-679	F-3	52'-6 LVL	58	S	CARGO PUMP ROOM		1	D
	1	—	—		1/8	28	5	BRASS .05	ST MAIN DR			H 8	6450-779		UPPER DK	105 1/3		—		2	
	1	—	—				↓		EXH MAIN DR				↓			105 1/4		—		3	
	1	—	—				7 MOD.		ST DR		DRILL 7/16 I.D		6450-777			97 1/4		—		4	
	1	—	—						EXH DR							97	↓	—		5	
	1	—	—						ST DR							99 1/4	P	—		6	
	1	—	—				↓		EXH DR		↓					99 1/2		—		7	
	1	—	—				5		ST DR				6450-773			63 3/4		—		8	
	1	—	—						EXH DR							63 1/2		—		9	
	1	—	—						ST DR							67 1/2		—		10	
	1	—	—				↓		EXH DR							67 3/4		—		11	
	1	—	—				1		DRAIN							58		—		12	
	1	—	—	↓	↓	↓	↓	↓	↓	↓		↓	↓		↓	↓	↓	—		13	↓

ROUTING	CONTROL NO. SHOP	CONTROL NO. ERECTION	GROUP NO.	LABEL PLATE LIST	DRAWN	DATE	N N DRAWING NO.	HULL NO.	SHEET NO.	REV
			6350-2301 1005-SI	FOR STM & EXH SYS OUTSIDE MACHY SPACE	JMN CHK	APPD.	2960-123	613C 614C	9	D

K&E 19 1253 11-74 W2974• MN22B (REV. 1) (11X17)

2960-123

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SEPT. '80

4X

4002-60 CSD VAULT

4002-60

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 1-31-9
SIGNED

YARD PRINTS | ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS													
REV.	G	G	B	A	A	A	C	E	G	F	C	C
SHEET	1	2	3	4	5	6	7	8	9	10	11	12

GROUP
MC NO.

PARTIAL ISSUE
SHEETS 1, 2, 9

NNS&DDCO HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C	310		
613C	309	T11-S-1162	

DWG. REV. — HULL APPLIC.

REV.	613C	614C
A	YES	YES
B	YES	YES
C	Yes	Yes
D	YES	YES
E	YES	YES
F	Yes	Yes
G	YES	YES

APPROVALS
OWNERS
ABS NOT REQ'D
USPH
USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
TENNECO
Commercial Ship Division
FSCM NO. 43689

COMMERCIAL SHIP DESIGN DEPT.

INSTALLATION GROUP: 4002-1601-1001, 4002-1601-1002, 6950-1601-1001, 6950-0121-1002, 6454-1601-1001, 6950-0120-1002

PIPE DETAILS 4002-61
FOR ARR SEE NN DWG 4002-59

SCALE NONE =1 Ft.
DRAWN W. D. Burton, Jr.
CHECKED E W Buckingham
SECT. MGR. J K Johnson
DATE COMPL. 7-19-77
EXAMINED —
AUTHORIZED A. Conley/
DATE 7-21-77
TECH. APPROVAL NOT REQ'D
CSD APPROVAL R. L. Harrington

GROUPED CHK. BY
DATES COMP. PART
HULL 613C GROUP NO. KEY
TYPE OF DWG. —

TITLE
PIPING ARR
EMER DIESEL GEN. RM
LIST OF MATERIAL

DWG. NO. 4002-60 REV G SHEET NO. 1 OF 12

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE	7/19/77	JKJ	—	—
B	7	INCREASED F-2 QTY FROM 9 TO 13.				
	8	INCREASED F-2 QTY FROM 27 TO 29. WDB				
	3	ADDED LINES 10, 11, 12, & 13	9/9/7	AC		
	5	ADDED LINES 7, 8, 10, & 11		JKJ	—	—
C	7	DELETED LINE 2. DECREASED QTY LN 6 WAS 13.			—	—
	11	ALT'D LINE 4 WAS 1½ COUPLING ADDED LINE 5				
	12	ALT'D LINE 1 WAS P4Q DELETED LINE 2 LAM	11/21/7	AC JKJ	—	—
D	8	DELETED LINE 2	2/7/8	AC		
	9	ADDED LINE 4 & 5 LAM		JKJ		
E	8	ALT'D LINE 6 & 7 QTY'S WERE 29 & 2 RESP	6/26/8	AC		
	9	ADDED LINE 8 LAM		JKJ		
F	10	S/M OF LINE NO. 2 WAS 6000-C11 ⑱ WORK ACCOMP ON 613C.	1/4/9	AC		
	9	ADDED LINES 9 THRU 13. (WORK ACCOMP ON 613C BY LIAISON NO. 613C-JHJ-48)		JKJ		
G	9	ALT'D DESCRIPTION OF L'S 9, 10, 12 & 13, SIZE WAS 1¼" INLIEU OF 1½". DELETED L-11, ADDED L-14. LNS. ITEM NO WAS F13. WORK PREVIOUSLY ACCOMPLISHED NOT AFFECTED	1/31/9	AC JKJ		

3	DIAG - POTABLE WATER SYSTEM - LIST	2350-1343
2	DIAG - COMPRESSED AIR SYS - LIST	6454-536
1	DIAG - FUEL OIL & DIESEL OIL SERV, FILL & TRANS SYS - LIST	6950-99
	REFERENCES	DWG. NO.

HULL NO. 613C, 614C DWG. NO. 4002-60 REV G
SHEET 2 OF

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P1A	14" IPS x STD THK CARBON STL	PIPE DET 4002-61	PF-PS	
	2	1	P1B	↓	↓	↓	
	3	1	P1C	↓	↓	↓	
	4	1	P1D	↓	↓	↓	
	5	1	P1E	↓	↓	↓	
B	6	2	F1	14" INSULATED BHD SLEEVE 216522 ITEM 90	MO 283173 S.12 L1	ST-PS	
	7	1	—	MUFFLER SILENCER	P.O. 613 ① 4002-C2	MD-PS	
	8						
	9						
B	10	1	RH-2	14" ROD HGR	MO 283200 SH 3 L15	ST-PS	
B	11	1	TR-2	14" TIE ROD	MO 283200 SH 3 L6	↓	
B	12	1	SH-1	14" SPRING HGR	PO ⑪⑤ 6552-C16	MD-PS	
B	13	1	SH-2	14" ↓ ↓	↓ ⑪⑥	↓	
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - EMER DIESEL GEN RM
SH 1 OF 2
GROUP NO. 4002-1601-1001 PI
APPLICABLE HULLS 613C 614C
DWG NO. 4002-60 SHEET 3 REV. B

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	12	Z1	14"	BOLTS	1" HVY HEX HD L = 3¾"	P.O. 613C 6000-C12 ⑱	MD-PS	
	2	12			NUTS	1" HVY HEX	P.O. 613C 6000-C11 ⑤	↓	
	3	1			GSKT	COMPRESSED ASBESTOS 1/16" THK	MO 283173 S 9 L 2	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - EMER. DIESEL GEN RM
SH 2 OF 2
GROUP NO. 4002-1601-1001 PI
APPLICABLE HULLS 613C 614C
DWG NO. 4002-60 SHEET 4 REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE No.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P2F	10" IPS x STD THK CARBON STL	PIPE DETAIL 4002-61	PF-ST	
	2	1	P2G	↓	↓	↓	
	3						
	4						
	5						
	6		HGR NO				
B	7	1	RH-1	10" ROD HGR	MO 283200 SH 3 L12	ST-PS	
B	8	1	TR-1	10" TIE ROD HGR	MO 283200 SH 3 L1	↓	
	9						
B	10	2	F-13	10" PIPE CLAMP	S 25-44-466	ST-PS	
B	11	2	F-14	PIPE SUPPORT LEG 24" LONG	S 25-50-614	↓	
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - EMER DIESEL GEN RM
SH 1 OF 2
GROUP NO. 4002-1601-1002 SI
APPLICABLE HULLS 613C 614C
DWG NO. 4002-60 SHEET 5 REV. B

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	48	Z2	10"	BOLTS	⅞" HVY HEX HD L = 3¼"	P.O. 613C 6000-C13 ㉓	MD-PS	
	2	48			NUTS	⅞" HVY HEX	P.O. 613C 6000-C13 ㉓	↓	
	3	4			GSKT	COMPRESSED ASBESTOS 1/16" THK	15-01-286	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - EMER. DIESEL GEN RM
SH 2 OF 2
GROUP NO. 4002-1601-1002 SI
APPLICABLE HULLS 613C 614C
DWG NO. 4002-60 SHEET 6 REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE No.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	98'-0"	P-5	¾" IPS x X-STG CARBON STL	57-07-103	PS	
C	2	~~1~~	~~V-1690~~	~~¾" GLOBE STOP, BRZ, SCR'D~~	~~P.O.~~ ④ 6450-C27	MD-PS	
	3	1	V-1691	¾" GLOBE STOP, BRZ, SCRD	PO ④ 6450-C27	↓	
	4	1	V-1692	↓	↓	↓	
G	5	1	F-10	MOIST SEPARATOR	MO 283173 S9 L6	ST-PS	
C	6	11	F-2	¾" ELL 90° FGD. ST, SW, 3000#	25-60-007	↓	
	7	3	F-3	¾" TEE FGD. STL, SW, 3000#	25-60-078	↓	
	8	2	F-4	¾" BHD SLEEVE STL	25-20-356	↓	
	9	1	V-1693	¾" GLOBE STOP, BRZ, SCR'D	P.O. ④ 6450-C27	↓	
	10	1	F-11	¾" COUPLING, FGD STL, SW, 3,000#	25-60-053	↓	
	11	4	F-12	¾" HOSE ADAPTER	P.O. ① 6454-C13	↓	
	12	9	H-7	¾" FIXED HANGER - NO LINER	25-45-332	B10-PS	
	13	4	H-2	↓	25-41-332	↓	
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - EMER DIESEL GEN RM
SH 1 OF 1
GROUP NO. 6454-1601-1001 SI
APPLICABLE HULLS 613C 614C
DWG NO. 4002-60 SHEET 7 REV. C

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1		P3H	2½" IPS STD THK, CARBON STL	PIPE DET 4002-61	PF-ST	
D		2		~~P3J~~	↓	↓	↓	
		3		P4K	1½" IPS STD THK, CARBON STL	↓	↓	
		4		P4L	↓	↓	↓	
		5	160'-0"	P5	¾" IPS x X-STG, STL	57-07-103	↓	
E		6	31	F-2	¾" ELL 90° CS, SW, 3000#	25-60-007	ST-PS	
E		7	4	F-4	¾" BHD SLEEVE, STL	25-20-356	↓	
		8	1	F-5	¾" Y STRAINER SW, CS	P.O. ② 6450-C8	↓	
		9	7	J-1	¾" FLG 150# SOC-WELD CARBON STL	25-18-841	↓	
		10	1	V-959	¾" GLOBE STOP, 600#, SW, CARBON STL	P.O. ⑥ 6450-C9	MD-PS	
		11	1	V-1037	¾" GLOBE STOP, 600#, SW, CARBON STL	↓	↓	
		12	1	V-1038	↓	↓	↓	
		13	1	F-6	¾" PIPE CAP SCRD, BRZ	25-06-108	ST-PS	
		14	2	F-7	1" x ¾" INSERT REDUCER S.W., STL	P.O. ㊲ 6200-M12	↓	
		15	2	F-8	1" ELL 90°, S.W., STL	P.O. ⑦ 6951-C3	↓	
		16	2	F-9	FLEXIBLE HOSE	P.O. ① 4002-C5	↓	
		17	2'-0"	P-7	1" IPS x X-STG, STL	57-07-104	↓	
		18	1	H-2	2½" FIXED HANGER - NO LINER	25-41-382	B10-PS	

REMARKS -

SERVICE - EMER DIESEL GEN RM
MC PS-192
SH 1 OF 3
GROUP NO. 6950-1601-1001 SI
APPLICABLE HULLS 613C 614C
DWG NO. 4002-60 SHEET 8 REV. E

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	6	H-7	1½" FIXED HANGER - NO LINER	25-45-362	B10-PS	
		2	5	H-7	¾" FIXED HANGER - NO LINER	25-45-332	↓	
		3	16	H-2	¾" FIXED HANGER - NO LINER	25-41-332	↓	
D		4	1	J2	2½ FLANGE SLIP-ON 150# STL	~~S~~ 25-18-432	ST-PS	
G		5	-	F18	¼" x 3" FLATBAR 9'-0" LONG	S/ 71-30-495	↓	
		6						
		7						
E		8	1	V1039	¾ GLOBE STOP, 600#, SW CARBON STL	PO ⑥ 6450-C9	ST-PS	
G		9	2	F-15	1½" ELL 90° S.W. STL 3000#	S/ 25-60-010	↓	
↓		10	1	F-16	1½" x ¾" INSERT RED STL 3000#	S/ 25-60-379	↓	
↓		~~11~~	~~40'0"~~	~~P6~~	~~1¼ x STD THK PIPE STL~~	~~S/ 57-06-105~~	↓	
↓		12	7	H-2	1½" FIXED HANGER NO LINER	S/ 25-41-362	↓	
↓		13	3	F-17	1½" COUPLING S.W. STL 3000#	S/ 25-60-056	↓	
↓		14	40'0"	P4	1½ x STD THK PIPE STL	S/ 57-06-106	ST-PS	
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - EMER DIESEL GEN RM
MC PS-192
SH 2 OF 3
GROUP NO. 6950-1601-1001 SI
APPLICABLE HULLS 613C 614C
DWG NO. 4002-60 SHEET 9 REV. G

4002-60

MICRO-MASTER® 105 mm
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SEPT. '80
FRAME
8X

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	4	Z3	2½"	BOLTS	5/8" HVY HEX HD, L = 2 7/8"	P.O. 613C 6000-C7 (61)	MD-PS	
F	2	4			NUTS	5/8" HVY HEX HD	P.O. 613C 6000-C12 (63)	↓	
	3	1			GSKT	COMPRESSED ASBESTOS 1/16" THK	15-01-272	ST-PS	
	4	4	Z4	1½"	BOLTS	1/2" HVY HEX HD, L = 2 5/8"	P.O. 613C 6000-C13 (42)	MD-PS	
	5	4			NUTS	1/2" HVY HEX HD	P.O. 613C 6000-C11 ①	↓	
	6	1			GSKT	COMPRESSED ASBESTOS 1/16" THK	15-01-268	ST-PS	
	7	28	Z5	3/4"	BOLTS	1/2" HVY HEX HD, L: 1¾"	P.O. 613C 6000-C12 ⑫		
	8	28			NUTS	1/2" HVY HEX HD	P.O. 613C 6000-C11 ①	↓	
	9	7			GSKT	COMPRESSED ASBESTOS 1/16" THK	15-01-262	ST-PS	
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –

SH 3 OF 3

SERVICE – EMER DIESEL GEN RM	GROUP NO.	6950-1601-1001 SI	
APPLICABLE HULLS: 613C 614C	DWG NO. 4002-60	SHEET 10	REV. F

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P4M	1½" IPS STD THK, CARBON STL	PIPE DETAIL 4002-61	PF-ST	
		2	1	P4N	↓	↓	↓	
		3	1	P4P				
C		4	1	P4Q			PS	
C		5	1	P4R	↓	↓	↓	
		6	10	H-2	1½" FIXED HANGER-NO LINER	25-41-362	B10-PS	
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SH 1 OF 1

SERVICE – EMER DIESEL GEN RM	GROUP NO.	6950-0121-1002 PI	
APPLICABLE HULLS: 613C 614C	DWG NO. 4002-60	SHEET 11	REV. C

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1		P4S	1½" IPS STD THK, CARBON STL	PIPE DETAIL 4002-61	PF-PS	
		2					↓	
		3						
		4	3	H-2	1½" HANGER - NO LINER	25-41-362	B10-PS	
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SH 1 OF 1

SERVICE – EMER DIESEL GEN RM	GROUP NO.	6950-0120-1002 PI	
APPLICABLE HULLS: 613C 614C	DWG NO. 4002-60	SHEET 12	REV. C

4002-60

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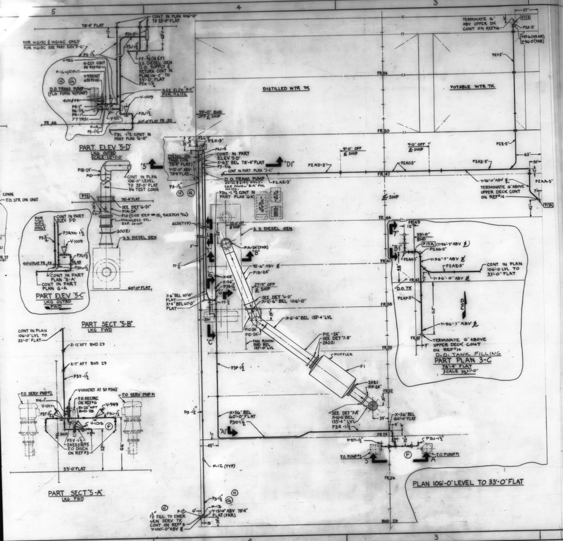
SEPT. '80

FRAME

8X


5
4
3
2
CONT IN PLAN 106'-0" TO 33'-0" FLAT
78'-4" FLAT
P2H-3"
P3J-1½"
FOR HG13C & HG14C ONLY
FOR HG15C SEE PART ELEV "5-C"
P3-1½"
P5-¾(N & F)
S.S. DIESEL GEN D.O. SUPPLY & RETURN CONT IN PLAN 106'-0" TO 33'-0" FLAT
P3K-1½
V-956
G-227 CONT ON REF #10
F-16 W/(1) F-17
V-958 (SET @ 50 PSIG)
D.O. TRANS PUMP (FLG FURN W/PUMP)
4JJ21 #421
P4-1"
P6-½
P4-1"
77TRS1
V-951
V-1009
SEE ELEV "5-C" FOR HG15C
P3L-1½"
FR 46
60'-0" FLAT FR 50
F-14
P3-1½"
P3L-1½ CONT IN PART PLAN "6-A"
PART. ELEV "5-D"
LKG OUTBD
SCALE: 1/2"=1'-0"
P1B-24"
P2D
CONT IN PLAN 106'-0" LEVEL TO 33'-0" FLAT
¾ TEST CONN
P72
78'-4" FLAT
SEE DET "6-D1"
P1A-24"
F11
F10 (SEE REF #15, SKETCH 96)
STAINLESS STL. EXP. JOINT
20021
S.S. DIESEL GEN
60'-0" FLAT
"D" CONN
F.O. STR ON UNIT
FR 37
FOR G15C ONLY
CONT IN PART ELEV 5-D
P3AM-1½"
P5-¾"
V-1009
P3L-1½"
60'-0" FLAT FR 48
FR 49
P3AL-1½"
CONT IN PART PLAN "8-A"
CONT IN PART PLAN 6-A
PART ELEV "5-C"
LKG OUTBD
FWD
PART SECT "5-B"
LKG FWD
CONT IN PLAN 106'-0" LVL TO 33'-0" FLAT
Z-12" AFT BHD 29
Z-7" AFT BHD 29
P3S-1½"
V-1010 (SET AT 50 PSIG)
F.O. SERV PMP #2
F.O. SERV PMP #1
P4-1"
V-1011
P3T-1½"
F.O. RECIRC ON REF #6
Z-25" AFT BHD 29
V-949
P3U-1½"
V-1013
℄ SHIP
P3V-1½"
24ES3 W/F5
F.O. DISCH ON REF #3
52"
66"
33'-0" FLAT
PART SECT "5-A"
LKG FWD
DIESEL OIL TANK (ON 78'-4" FLAT)
Y-13'-0" ABV 78'-4" FLAT
P2G-3"
P2H-3"
P3J-1½"
CONT IN PART ELEV "5-D"
X-63" BEL 78'-4" FLAT
P5-¾
"5"
"D1"
CONT IN PART PLAN "3-C"
D.O. TRANS PUMP
HG13C & G14C ONLY. SEE PANEL "8-A" FOR HG15C.
P2AE-3"
P3-1½"
P3N-1½ CONT IN PART PLAN "6-A"
6CS1 (TYP)
33'-0" OFF ℄ SHIP
S.S. DIESEL GEN
P1A-24" (FAR)
"B"
"7"
"6"
"C"
P5-¾"
93'-6" ABV ℄
P1B-24"
X-48"
X-56"
P3N-1½"
27'-9" OFF ℄ SHIP
SEE DET "6-D"
X-12'-6" BEL 106'-0"
X-6'-6" BEL 135'-4" LVL
X-6" BEL 60'-0" FLAT
X-4" BEL 60'-0" FLAT
P1C-24
P1D-24"
FAN ROOM BHD BEL 135'-0" LVL
P1E-24"
SEE DET "7-B"
24021
MUFFLER
F1
2421
P1F-24"
P3P-1½"
X-56" BEL 60'-0" FLAT
P3Q-1½"
SEE DET "7-A"
X-6'-6" BEL 135'-4" LVL
P3R-1½"
"A1"
45"
39"
X-56" BEL 60'-0" FLAT
FR 29
FR 32
P3T-1½"
P3U-1½"
F.O. PUMP #2
F.O. PUMP #1
"5"
"A"
F-12 (TYP)
FR 26
BHD 23
P3-1½"
P-17
F-13
Y-13'-0" ABV 78'-4" FLAT (FAR)
1½" FILL TO EMER GEN SERV TK CONT ON REF #8
Y-100'-0" ABV ℄
8"
6"
PLAN 106'-0" LEVEL TO 33'-0" FLAT
DISTILLED WTR TK
POTABLE WTR TK
FR 54
FR 50
FR 47
FR 44
FR 41
FR 38
FR 35
39'-0" BHD OFF ℄ SHIP
9'-0" OFF ℄ SHIP
P2AD-3"
P2AC-3"
P2AB-3"
TERMINATE 6" ABV UPPER DK CONT ON REF #14
P17A
57"
P2X-3"
Y-97'-6 (NEAR)
Y-96'-0" (FAR)
P2Y-3"
P2Z-3"
63"
30"
12"
P2AA-3"
Y-96'-0" ABV ℄
TERMINATE 6" ABOVE UPPER DECK CONT ON REF #14
7"
42"
℄ SHIP
FR 49
12"
39'-0" BHD
"7"
"B-1"
P17A (Y-96'-2" ABV ℄)
P2AG-3"
P2AH-3"
Y-96'-7" ABV ℄
P2AE-3"
CONT IN PLAN 106'-0 LVL TO 33'-0" FLAT
Y-96'-0" ABV ℄
D.O. TK
P2AF-3"
48"
65"
FWD
Y-96'-7" ABV ℄
FR 45
TERMINATE 6" ABOVE UPPER DECK CONT ON REF #14
D.O. TANK FILLING
PART PLAN 3-C
78'-4" FLAT
SCALE ½"=1'-0"

REV	ZONE	DESCRIPTION	NNS & DD CO DATE	NNS & DD CO AUTH	OWNER DATE	OWNER APPD
A	-	INITIAL ISSUE	4/1/6	[illegible]	-	-
B	6-C 7B 4-C 5-D 6-A 4A	ADDED DECK SLEEVES IN 60'-0" FLAT FOR P5-¾ & PART ELEV 7-B ALT'D RUN OF ¾ PIPING TO SS DIESEL GEN ; PIPE DET P3L-1½, P3M-1½ & P3N-1½ IN PART PLAN 6-A & PART ELEV 5-D. LAM ADDED GEN. NOTE #17 & ADDED NOTE IN DET. "6-D1". ALT'D LOC OF 24" SS DIESEL GEN PIPING GOING INTO THE SMOKE STACK LAM	6/23/7	[illegible]	-	-
C	-	ADDED REF 14 & 3" DIESEL OIL TK FILLING PIPING LAM	12/14/7	[illegible]	-	-
D		ALT'D P3S-1½ LAM	[illegible]	[illegible]	-	-
E	-	ALT'D LOC OF D.O. TRANS PUMP FOR HG15 ONLY ADDED ½ & ¾ BOSSES TO P1A-24 ADDED REF #16	5/15/[illegible]	[illegible]	-	-
F	6C 3A 5A	PART ELEV "6-C" ALT'D PIPING AROUND S.S. DIESEL GEN. (WORK ACCOMP ON G13C) PLAN 106'-0" LVL TO 33'-0" FLAT, ALT'D. RUN OF P3T & P3U PART SECT "5-A" ALT'D TO SUIT. (WORK ACCOMP. ON G13C.)	3/13/8	[illegible]	-	-
G	[illegible]	PLAN 106'-0" LVL TO 33'-0" FLAT; ALT'D PIPE SIZE OF D.O. TRANS PUMP DISCH FROM ¾" TO 1¼". PART ELEV "5-D" ALT'D TO SUIT. (WORK ACCOMP ON G13C BY LIAISON NO. G13C-141-48.)	1/4/9	[illegible]		
H		PART ELEV "5-D" & PLAN VIEW 106'-0" LVL TO 33'-0" LVL; ALT'D D.O. TRANS PUMP DISCH FROM 1¼ TO 1½". WORK PREVIOUSLY ACCOMPLISHED NOT AFFECTED	11/31/9	[illegible]		

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN DEVELOPED IN ACCORDANCE WITH REF #1 & #2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REF #2 FOR ADDITIONAL INFORMATION ON MATERIALS FOR DIESEL OIL PIPING. DIESEL EXHAUST PIPE IS SEAMLESS STEEL ASTM-A53 .406" THICK.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF USCG, ABS AND REF #4.
4. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS: BUTT WELDS ARE P-3, SOCKET WELDS P-14, SLIP-ON FLANGES P-16 A ON REF #4 UNLESS OTHERWISE NOTED.
5. BACKING RINGS AND COUPLINGS ORDERED ON LIST MATERIAL ARE TO BE USED AS REQUIRED.
6. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THAT SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMP AND ETC.
7. PAINTING IS TO BE IN ACCORDANCE WITH REF #5.
8. TESTS ARE TO BE IN ACCORDANCE WITH REF #2.
9. HANGERS ORDERED ON LIST OF MATERIAL ARE TO BE USED AS REQUIRED AND ARE TO BE INSTALLED IN ACCORDANCE WITH REF #8 UNLESS OTHERWISE NOTED.
10. PIPE SIZES SPECIFIED ARE NOMINAL IPS OUTSIDE DIAMETERS.
11. ALL HOLECUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.
12. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT, "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
13. GAGE PIPING IS TO BE IN ACCORDANCE WITH REF #9.
14. LOCATION DIMENSIONS ARE REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
15. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN. ALL BENDING RADII SHALL BE 5 TIMES THE NOMINAL DIAMETER.
16. ALL PIPING ON THIS DRAWING IS CLASS II.
17. THE FOLLOWING DATA IS FOR THE 24" DIESEL GENERATOR EXHAUST:
    - A. EXHAUST GAS FLOW - 13,800 ft^3/min.
    - B. EXHAUST GAS VELOCITY - 78 ft/sec.
    - C. EXHAUST BACK PRESSURE - 4.41 INCH H_2O

FOR LIST OF MATERIAL
NN DWG 4002-63

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
G15C	311	
G14C	310	
G13C	309	

NO.	REFERENCES	DWG NO.
15	PP ARR MISC INST IN ER	6755-67
14	PIPING ARR CARGO OIL, F.O., D.O. & TK WASH SYS	2600-83
13	PIPING ARR DIESEL GENERATOR LO FILL	4002-72
12	ARR OF PIPING IN OUTER SMOKE STACK	6451-499
11	STD PIPE HANGERS & INSTALLATION INSTRUCTION	257056
10	LIST OF PRESS & VAC GAGES FURN BY SHIPYARD	6750-483
9	TYP ARR OF GAGE PIPING	6750-481
8	ARR. OF EMER DIESEL GEN RM	4002-59
7	PIPING ARR F.O. SERV RECIRC (G15C ONLY)	6950-113
6	PIPING ARR F.O. SERV RECIRC (G13C & G14C ONLY)	6950-109
5	PAINTING SCHEDULE	8300-40M1
4	FAB & WELDING INSTR FOR CL I & 2 PIPING	257035
3	PIPING ARR F.O. SERV DISCH SYS	6950-100
2	DIAG F.O. & D.O. SERVICE, FILL & TRANSFER SYS L/M	6950-99
1	DIAG F.O. & D.O. SERVICE, FILL, & TRANSFER SYS ARRGT	6950-98

APPROVALS
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ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

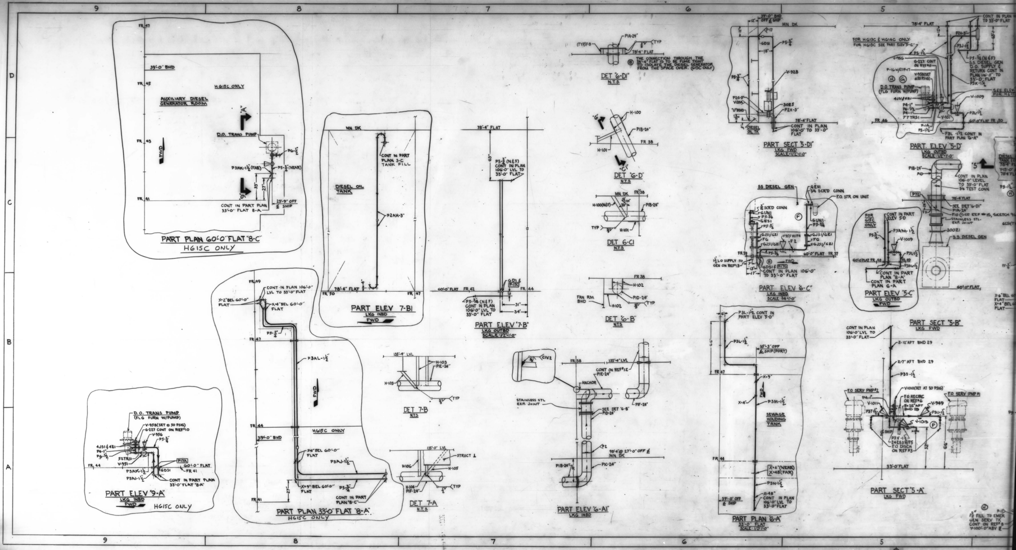
SCALE ¼ OR AS NOTED = 1 FT
DRAWN L. A. MCNEIL
CHECKED TE SEAMAN
SECT MGR J. H. Johnson
TECH APPROVAL 2-4-76
DATE COMPL. 6-4-76
EXAMINED —
AUTHORIZED E. E. Stephenson
DATE 6-4-76
C S D APPROVAL E E S for R. L. HARRINGTON

PIPING ARR SS DIESEL GEN SYS
PLAN, SECT & ELEV

USMA DESIGN T11-S-116a
USMA DWG NO. —
HULL NO. —
DWG NO. 4002-62
REV H
SHEET NO. 1 OF 1

4002-62

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 1



PART PLAN 60'-0" FLAT "8-C"
H615C ONLY
AUXILIARY DIESEL GENERATOR ROOM
D.O. TRANS PUMP
PART ELEV 7-B1
LKG INBD
DIESEL OIL TANK
PART ELEV "7-B"
LKG OUTBD
SCALE 1/2"=1'-0"
DET "6-D1"
N.T.S.
THE CONNECTION THROUGH THE 78'-4" FLAT IS TO BE FUME TIGHT TO ISOLATE THE DIESEL GENERATOR FROM THE SPACE OVER. (615C ONLY)
DET "6-D"
N.T.S.
DET 6-C1
N.T.S.
DET "6-B"
N.T.S.
PART SECT 5-D1"
LKG FWD
SCALE 1 1/2"=1'-0"
PART ELEV "5-D"
LKG OUTBD
SCALE 1/2"=1'-0"
SS DIESEL GEN
PART ELEV "6-C"
LKG INBD
PART ELEV "5-C"
LKG OUTBD
PART SECT "5-B"
LKG FWD
PART ELEV "9-A"
LKG INBD
H615C ONLY
PART PLAN 33'-0" FLAT "8-A"
H615C ONLY
DET 7-B
N.T.S.
DET 7-A
N.T.S.
PART ELEV "6-A1"
LKG INBD
SEWAGE HOLDING TANK
PART PLAN "6-A"
33'-0" FLAT
SCALE 1 1/2"=1'-0"
PART SECT "5-A"
LKG FWD
F.O. SERV PMP #2
F.O. SERV PMP #1
9
8
7
6
5
D
C
B
A

4002-62

MICRO-MASTER 105 mm

K+E

SEPT. '80

10X

FRAME 2

4002-63

CSD-V
E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 1-31-7
SIGNED

YARD PRINTS | ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS													
	REV.	G	G	D	F	F	A	A	D	A	A	D	G
	SHEET	1	2	3	4	5	6	7	8	9	10	11	5A

GROUP
MC NO.

PARTIAL ISSUE
SHEETS 1, 2, 5A

NNSB&DDCo HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
G15C	311		
G14C	310		
G13C	309		

DWG. REV. — HULL APPLIC.

REV.	G13C	G14C	G15C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	YES
E	YES	YES	NO
F	YES	YES	NO
G	YES	YES	NO

APPROVALS
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Newport News Shipbuilding
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Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING

ARR DWG: 4002-62
PIPE DETAIL: 4002-64
INSTALLATION GROUPS: 4002-0106-1001 SI, 4002-0114-1003 PI, 4002-0113-1002 PI, 4002-1601-1004 PI, 4002-0119-1002 PI

SCALE NONE
DRAWN L.A. MCNEIL
CHECKED T.E. SEAMAN
SECT. MGR. J.H. Johnson
DATE COMPL. 6-4-76
EXAMINED
AUTHORIZED E.E. Hydman
DATE 6-4-76
TECH. APPROVAL NR
CSD APPROVAL EEH for R.L. HARRINGTON

HULL G13C
TYPE OF DWG. —

TITLE
PIPING ARR SS DIESEL GEN SYS
LIST OF MATERIAL

DWG. NO. 4002-63 REV G SHEET NO. 1 OF 10

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D.	OWNER DATE	OWNER APPD.
A	—	INITIAL ISSUE RJP	6/4/6	JHJ	—	—
B	5	LINE 6 QTY WAS 2 LAM	6/24/7	JHJ		
	4,7,8,3	LINES 13-15, 6 AND 10-12 RESP., CHGD S/M				
C	3 5 11	LINE 13 QTY WAS 235'-0" LINE 1 & 6 QTY WERE 14 & 4 RESP SHT 11 ADDED LAM	11/19/7	JHJ AC		
D	4 5 8 8 11 11 3	ADDED LINE 11 & 12 ALT'D QTY OF LINE 5 WAS 3 ALT'D QTY OF LINE 4 WAS 55'-0" (H615 ONLY) ADDED LINE 14 & 15 (H615 ONLY) ALT'D LINE 2 QTY WAS 19'-6" (H615 ONLY) ADDED LINE 3 (H615 ONLY) ADDED LINE 7A (H615 ONLY)	5/19/8	AC JHJ		
E	5	ALT'D LINE 8 QTY WAS 1 LAM	9/11/8	AC		
		WORK ACCOMPLISHED ON H613C		JHJ		
F	4	ALT'D DESCRIPTION OF L.6 WAS 3/4", S/M WAS 6450-C29 ⑤				
	5	DELETED L'S 3 & 4.				
	5A	ADDED SHT 5A	1/4/9			
		(THE ABOVE WORK ACCOMP. ON 613C BY LIAISON NO. G13C-JHJ-48.		JHJ		
G	5A	ALT'D DESCRIPTION OF L'S 1, 2, 3, 5 & 6, SIZES WERE 1 1/4 IN LIEU OF 1 1/2". DELETED LINES 4 & 8. ADDED LINE NO. 9.	1/31/9	AC JHJ		

NOTE

1. FOR ADDITIONAL INFORMATION ON MATERIAL SEE REF #1

NO.	REFERENCES	DWG. NO.
1	DIAG F.O. & D.O. SERV, FILL & TRANSFER SYS L/M	6950-99

HULL NO. G13C, G14C, G15C DWG. NO. 4002-63 REV G SHEET 2 OF —

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1A	24" IPS x .486" THK PIPE CARBON STL	PIPE DETAIL 4002-64	PS	
		2	1	P1B				
		3	1	P1C	↓			
		4	1	P2G	3" STD			
		5	1	P2H	↓			
		6	1	P3J	1 1/2"			
	—	7	1	P3K				
D	*	7A	1	P3AM				
		8	1	P3S				
		9	1	P3T				
		10	1	P3U				
		11	1	P3V	↓	↓		
		12	48'	P4	1" IPS x STD THK PIPE STL	K57-06-104		
C		13	215'-6"	P5	3/4" "X" HVY	K57-07-103	↓	
		14						
		15						
		16	2	H-100	SPEC HANGER	MO 257726 S6 L13	ST-PS	
		17	1	H101	↓	S7 L1	↓	
		18						

REMARKS –
*H615C ONLY
- H613C & 614C ONLY

SERVICE – S.S. DIESEL GEN PIPING
GROUP NO. 4002-0106-1001 SI SHT 1 OF 4
APPLICABLE HULLS G13C G14C G15C
DWG NO. 4002-63 SHEET 3 REV. D

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V-928	3" BUTTERFLY STL 150# (MOTOR OPER)	PO ㉓ 6950-M8	MD-PS	
		2	1	V-949	1 1/2" GL ST CHK 600# SW STL	PIPE DET 4002-64	PS	
		3	1	V-951	1 1/2"	↓	↓	
		4	1	V-955	3/4	PO ⑥ 6450-C9	MD-PS	
F		5	1	V-956	1 1/2" CHK	PO ⑥ 6450-C29		
		6	1	V-958	1/2" ANGLE RELIEF 150# FLG (SET AT 50PSIG)	PO ㉚ 6450-C7	↓	
		7	1	V-1009	1 1/2" GL ST CHK 600# SW	PIPE DETAIL 4002-64	PS	
		8	1	V-1010	1" ANGLE REIEF 3000# (SET AT 50PSIG)			
		9	1	V-1011	1 1/2" GL ST CHK 600#			
		10	1	V-1013	↓	↓	↓	
D		11	1	F10	3/4" BOSS STL SW x WELD BASE	S/ 25-02-224	ST-PS	
D		12	1	F11	1/2 BOSS STL THD x WELDBASE	S/ 25-02-124	↓	
B		13	1	H-2	3" FIXED HANGER (NO LINER)	25-41-392	ST-PS	
B		14	7	H-2	1 1/2"	25-41-362		
B		15	30	H-2	3/4" ↓	25-41-332	↓	
		16						
		17						
		18						

REMARKS

SERVICE – S.S. DIESEL GEN PIPING
MC No PS-161
GROUP NO. 4002-0106-1001 SI STH 2 OF 4
APPLICABLE HULLS G13C G14C G15C
DWG NO. 4002-63 SHEET 4 REV. F

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	C	1	13	6CS1	3/4" COUPLING S.W. 3000# STL	25-60-053	ST-PS	
		2	1	77TRS1	1"x1"x1/2" RED TEE	25-60-235		
F		~~3~~	~~1~~	~~70TRS1~~	~~1"x3/4"x1/2"~~	~~25-60-239~~		
F		~~4~~	~~1~~	~~52TRS1~~	~~3/4"x3/4"x1/4"~~	~~25-60-226~~		
		5	2	6ES1	3/4" 90° ELL ↓	PO ④ 6200-M12	MD-PS	
D		6	4	6DS1	3/4" DECK SLEEVE STL ④ 216522	25-20-356	ST-PS	
		7	1	24ES3	2 1/2" ELL 90° L.R. B.W. STL	PO ① 6450-C25	MD-PS	
E		8	2	6UN1	3/4" UNION 300# SCRD M.I.	25-12-166	ST-PS	
		9	1	F-2	3/4" Y-STRAINER S.W. STL	PO ① 6450-C8	MD-PS	
		10	1	F-3	5/8 O.D. x 3/4" IPS MALE x MALE ADAPTOR STEEL	MO 283173 SH 3 L5	ST-PS	
		11	1	F-4	LOCKING DEVICE (LOCKED OPEN)	MO 283173 S5 L1		
		12	1	F-5	2 1/2" PIPE PLUG WITH 1" S.W. BORE	MO 216707 S1 L4	↓	
		13	2	F-6	3/4" FLEX CONN 150# FLG	PO ① 4002-C5	MD-PS	
		14						
		15	6	F-8	ANCHOR SUPPORT 3" "X" HVY PIPE ㉚ 257339 12" LONG	MO 257339 S1 L11	ST-PS	
		16	1	10JS1	1" FLG 150# SLIP-ON STL	PO ⑳ 6450-C34	MD-PS	
		17	4	6JS1	3/4"	㉛		
		18	2	4JS1	1/2" ↓	↓ ㉜	↓	

REMARKS –

SERVICE – S.S. DIESEL GEN PIPING
MC No PS-161
GROUP NO. 4002-0106-1001 SI SHT 3 OF 4
APPLICABLE HULLS G13C G14C G15C
DWG NO. 4002-63 SHEET 5 REV. F

& OUTFITTING GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
G		1	6	F-12	1 1/2 COUPLING STL S.W. 3000#	S/ 25-60-056	ST-PS	
G		2	1	F-13	1 1/2" BHD SLEEVE STL	S/ 25-20-390		
G		3	1	F-14	1 1/2x1 1/2x1/4 RED TEE S.W. 3000# STL	S/ 25-60-275		
G		~~4~~	~~2~~	~~F-15~~	~~1 1/2 x 1 1/4 INSERT RED STL S.W. 3000#~~	~~S/ 25-60-377~~		
G		5	1	F-16	1 1/2x1 1/2x1/2 RED TEE S.W. 3000# STL	S/ 25-60-273		
G		6	1	F-17	1 1/2x1 INSERT RED STL S.W. 3000#	S/ 25-60-378	↓	
		7						
G		~~8~~	~~120'-0"~~	~~P-6~~	~~1 1/4" IPS x STD THK PIPE STL~~	~~S/ 57-06-105~~	~~ST-PS~~	
G		9	120'-0"	P3	1 1/2" IPS x STD THK PIPE STL	S/ 57-06-106	ST-PS	
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – S.S. DIESEL GEN PIPING
MC No PS-161
GROUP NO. 4002-0106-1001 SI
APPLICABLE HULLS G13C G14C
DWG NO. 4002-63 SHEET 5A REV. G

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	20			BOLTS	1 1/8" HVY HEX HEAD L=5 1/4"	6000 C7 (58)	MD-PS	
	2	20	200Z1	20"	NUTS	1 1/8" HVY HEX	6000-C11 ⑨	↓	
	3	1			GSKT	1/16" COMPRESSED ASBESTOS 150#	MO 216707 S1 L6	ST-PS	
	4	4			BOLTS	5/8 L=4 3/4"	6000 C7 (34)	MD-PS	
	5	4	30Z5	3"	NUTS	5/8	6000-C11 ②	↓	
	6	—			GSKT	—	—		
	7	4			BOLTS	1/2" L=2	6000-C7 ㉜	MD-PS	
	8	4	10Z1	1"	NUTS	1/2"	6000-C11 ①	↓	
	9	1			GSKT	1/16" 150#	15-01-264 E	ST-PS	
	10	16			BOLTS	1/2" L=2	6000-C7 ㉜	MD-PS	
	11	16	6Z1	3/4"	NUTS	1/2"	6000-C11 ①	↓	
	12	4			GSKT	1/16" 150#	15-01-262 E	ST-PS	
	13	8			BOLTS	1/2" L=1 3/4"	6000 C7 ㉝	MD-PS	
	14	8	4Z1	1/2"	NUTS	1/2"	6000-C11 ①	↓	
	15	2			GSKT	1/16" ↓ 150#	15-01-260 E	ST-PS	

SS DIESEL GEN PIPING
G13C G14C G15C
4002-0106-1001-SI SHT 4 OF 4
4002-63 6 A

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3P	1 1/2" IPS x STD THK CARBON STL	PIPE DETAIL 4002-64	PS	
		2	1	P3Q				
		3	1	P3R	↓	↓	↓	
		4						
		5						
B		6	7	H-7	1 1/2" FIXED HANGER (NO LINER)	25-45-362	ST-PS	
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – SS DIESEL GEN PIPING
GROUP NO. 4002-0114-1003 PI SHT 1 OF 1
APPLICABLE HULLS G13C G14C G15C
DWG NO. 4002-63 SHEET 7 REV. B

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3L	1 1/2" IPS x STD THK CARBON STL	PIPE DETAIL 4002-64	PS	
		2	1	P3M				
		3	1	P3N	↓	↓		
D	— *	4	35'-0" 85'-0"	P5	3/4" IPS x "X" STR THK CARBON STL	K57-07-103	↓	
		5						
		6						
		7	6	6CS1	3/4" COUPLING SW STL 3000#	25-60-053	ST-PS	
		8						
		9						
B		10	2	H-2	1 1/2" FIXED HANGER (NO LINER)	25-41-362	ST-PS	
B		11	4	H-7	1 1/2"	25-45-362		
B		12	8	H-1	3/4" ↓	25-40-332	↓	
		13						
D	*	14	1	P3AL	1 1/2" IPS x STD THK CARBON STL	PIPE DETAIL 4002-64	PS	
D	*	15	1	P3AJ	↓	↓	↓	
		16						
		17						
		18						

REMARKS –
*HG15C ONLY
- HG13C & G14C ONLY

SERVICE – SS DIESEL GEN PIPING
GROUP NO. 4002-0113-1002 PI SHT 1 OF 1
APPLICABLE HULLS G13C G14C G15C
DWG NO. 4002-63 SHEET 8 REV. D

4002-63

MICRO-MASTER® 105 mm
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SEPT. '80
FRAME
8X

4002-63

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1D	24" IPS x .486" THK PIPE STL	PIPE DETAIL 4002-64	PS	
		2	1	P1E	↓	↓	↓	
		3	1	P1F	↓	↓	↓	
		4						
		5						
		6	1	F1	24" MUFFLER FLG STL	PO ④ 4002-C1	MO PS	
		7						
		8						
		9	3	H-102	SPEC HANGER	MO 257726 S7 L8	ST-PS	
		10	3	H-103	↓	S8 L1	↓	
		11	1	H-104	↓	S8 L8	↓	
		12	1	H-105	↓	S9 L1	↓	
		13	1	H-106	↓	S.9 L.8	V	
		14						
		15						
		16						
		17						
		18						

REMARKS

SERVICE - S.S DIESEL GEN PIPING

									GROUP NO.	4002-1601-1004 PI SHT 1 OF 2		
APPLICABLE HULLS	G13C	G14C	G15C							DWG NO. 4002-63	SHEET 9	REV. A

INSTALLATION GROUP

REV.	LINE	QTY	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	40			BOLTS	1¼" HVY HEX HEAD L=5¾"	6000-C7 (63)	MO PS	
	2	40	240Z1	24"	NUTS	1¼ HVY HEX	6000-C11 ⑥	↓	
	3	2			GSKT	1/16" COMPRESSED ASBESTOS 150#	MO 216707 S1 L7	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –

SERVICE - S S DIESEL GEN PIPING

									GROUP NO.	4002-1601-1004 PI SHT 2 OF 2		
APPLICABLE HULLS	G13C	G14C	G15C							DWG NO. 4002-63	SHEET 10	REV. A

INSTALLATION GROUP

REV.	LINE	QTY		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	19'-6"	P2	3" IPS x STD THK PIPE STL	S/ 57-06-109	PS	
D – / *	2	~~19'-6"~~ 25'-0"	P5	¾" IPS x X"HVY THK PIPE STL	S/ 57-07-103	↓	
D *	3	1	P3AK	1½" IPS x STD THK PIPE STL	PMO 4002-64	PS	
	4						
	5						
	6						
	7	1	GCS1	¾" COUPLING SW STL 3000#	S/ 25-60-053	ST-PS	
	8	2	F9	3" 90° ELL BW STL STD	S/ 25-09-972	↓	
	9	1	GDS1	¾" DECK SLEEVE STL ④ 216522	S/ 25-20-356	↓	
	10						
	11						
	12						
	13						
	14	3	H-2	3" FIXED HANGER (NO LINER)	S/ 25-41-392	ST-PS	
	15	3	H-2	¾" ↓	S/ 25-41-332	↓	
	16						
	17						
	18						

REMARKS
* HG15C ONLY
– H G13C & HG14C ONLY

SERVICE S. S. DIESEL GEN PIPING

									GROUP NO.	4002-0121-1201 PI SHT 1 OF 1		
APPLICABLE HULLS	G13C	G14C	G15C							DWG NO. 4002-63	SHEET 11	REV. D

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2X	3" IPS x STD THK PIPE STL	PMO 4002-64	ST-PS	
		2	1	P2Y	↓	↓	↓	
		3	1	P2Z	↓	↓	↓	
		4	1	P2AA	↓	↓	↓	
		5	1	P2AB	↓	↓	↓	
		6	1	P2AC	↓	↓	↓	
		7	1	P2AD	↓	↓	↓	
		8	1	P2AE	↓	↓	↓	
		9	1	P2AF	↓	↓	↓	
		10	1	P2AG	↓	↓	↓	
		11						
		12						
		13						
		14						
		15						
		16	10	H-2	3" FIXED HANGER (NO LINER)	S/ 25-41-392	ST-PS	
		17						
		18						

REMARKS –

SERVICE - S.S. DIESEL GEN PIPING

									GROUP NO.	4002-0119-1002 PI SHT 1 OF 1		
APPLICABLE HULLS	G13C	G14C	G15C							DWG NO. 4002-63	SHEET 12	REV. C

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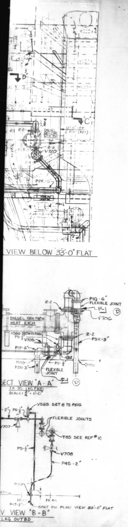
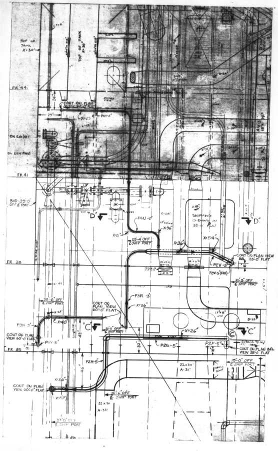
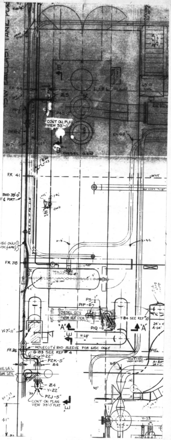
SEPT. '80
FRAME
8X


VIEW BELOW 33'-0" FLAT
P1Q-6"
FLEXIBLE JOINT
F-1
V706
DIESEL GEN FW/SW HEAT EXCH
V566 SET@75 PSIG
V705
P1P-6"
P3R-3"
FLEXIBLE JOINT
SECT VIEW "A-A"
FR 36 LKG FWD
SCALE 3/4"=1'-0"
V565 SET@75 PSIG
FLEXIBLE JOINTS
V707
T85 SEE REF# 10
V708
P4S-2"
CONT ON PLAN VIEW 33'-0" FLAT
V VIEW "B-B"
LKG OUTBD


TOP OF TANK
FR 44
FR 41
FR 38
FR 35
CONT ON PLAN VIEW 33'-0" FLAT
BHD 33'-0" OFF ℄ PORT
P1U-2"
SHIPPING OPENING IN 33'-0" FLAT
33'-4" OFF ℄ SHIP PORT
CONT ON PLAN VIEW BEL 33'-0" FLAT
P2V-5"
P3R-3"
CONT ON PLAN VIEW 60'-0" FLAT
P3N-3"
P2G-5"
P2F-5"
P2H-5"
CONT ON PLAN VIEW BEL 33'-0" FLAT
19'-0" OFF ℄ SHIP PORT
CONT ON PLAN VIEW 60'-0" FLAT
37'-0" OFF ℄ SHIP PORT

PLAN VIEW 33'-0" FLAT


FR 44
FR 41
FR 38
FR 35
CONT ON PLAN VIEW 33'-0"
DIESEL GEN
P4L-2" (615C ONLY)
P4EA-2" (613C & 614C)
DIESEL GEN FW/SW HEAT EXCH
P5-1/2"
P1P-6"
P1Q-6"
T-84 SEE REF# 10
HOLECUT & BHD SLEEVE FOR 615C ONLY
G-183 SEE REF# 4
P2K-5"
DIESEL GEN SW STR
P2J-5"
CONT ON PLAN VIEW 33'-0" FLAT

PLAN VIEW 60'-0" FLAT

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
A	ALL	INITIAL ISSUE	6/11/6		—	—
B		ADDED DK SLEEVES FOR PENETRATIONS INTO DIESEL GENERATOR SPACE AND ADDED DETAIL P4EA-2" FOR 615C ONLY. DIESEL RAISED 6" ℄ AND PIPING ALTERED TO ACCOMODATE CHANGE. P4S-2" ALTERED TO CLEAR OVERHAUL OPENING. P4T-2" & ASSOCIATED HOLE CUT IN FLAT ALTERED TO CLEAR DIESEL FDN.	6/15/7	AC	—	—
C	—	ALTERED DETAIL P2F-5" & P2G-5". WORK ACCOMPLISHED ON 613C.	5/17/8		—	—
D	-	SECT'A-A'; ADDED F-1 TO P1P-6" & P1Q-6" (WORK ACCOMP ON 613C BY LIAISON 613C-2HJ-14	9/7/8	AC		

AUTHORITY:

GENERAL NOTES:

[redacted]

13. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOW: BUTT WELDS TYPE P-3, SOCKET WELDS TYPE P-14, AND FLANGE WELDS TYPE P-16A ON REFERENCE 3 EXCEPT AS OTHRWISE INDICATED.

14. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.

15. ALL HOLECUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.

FOR LIST OF MAT'L SEE NN DWG# 4002-66.

REVISION APPLICABILITY			
REV	N.N. HULL NO.		
	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	NO

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS		
	ABS	NOT REQ'D
	USCG	NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

SCALE 1/2" OR AS NOTED = 1 FT
DRAWN E. R. SMOOT
CHECKED T E SEAMAN
SECT MGR J R Johnson
DATE COMPL. 6-11-76
EXAMINED
AUTHORIZED E F Stephenson
DATE 6-11-76
TECH APPROVAL NOT REQ'D
CSD APPROVAL R L Hennigh

PIPING ARR DIESEL GENERATOR S.W. COOLING - PLAN, SECT, ELEV

USMA DESIGN 111-S-116a
USMA DWG NO.
HULL NO.
DWG NO. 4002-65
REV D8
SHEET NO. 1 OF 1

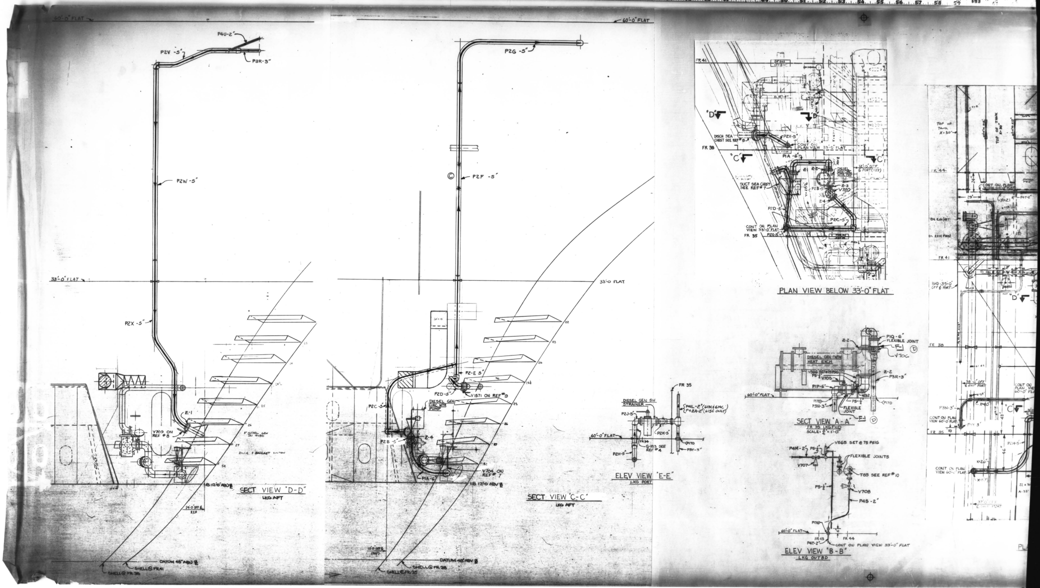
NO.	REFERENCES	DWG NO.
10	LIST OF THERMOMETERS FURN BY SHIPYARD	6750-482
9	PP ARR BILGE & BALLAST SYS ER-PLAN, SECT, ELEV	2280-682
8	ARR DISCHARGE SEA CONNECTIONS IN ER	6000-320
7	ARR SUCTION SEA CHESTS IN ER	6000-317
6	PAINTING SCHEDULE	8300-20● 21▲
5	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
4	TYPICAL ARRANGEMENT OF GAGE PIPING	6750-481
3	FABRICATION & WELDING INSTRUCTIONS-CL I & II PIPING	257035
2	ARR	6550-361
1	DIAGRAM - MN & AUX SEA WATER CIRC SYS - LIST	6550-360

●HULLS 613C & 614C
▲HULL 615 ONLY

REPRODUCTION OFFICE
DATE 9-7-8
GROUP:
MC NO.

4002.65

SEPT. '80
FRAME 1
10X


60'-0" FLAT
P4U-2"
P2V-5"
P3R-3"
P2W-5"
33'-0" FLAT
P2X-5"
Z-1
V709 ON REF #8
SECT VIEW "D-D"
LKG AFT
18 12'-0" ABV ℄
24'-0" OFF ℄ REF
DATUM 48" ABV ℄
SHELL @ FR 41
SHELL @ FR 38
P2G-5"
P2F-5"
33'-0" FLAT
P2-E 5"
P2D-5"
V1571 ON REF #9
P2C-5"
DIESEL GEN CIRC WTR PUMP
P2B-5"
Z-4
P1A-6
V704 ON REF #7
18 12'-0" ABV ℄
SECT VIEW "C-C"
LKG AFT
DATUM 48" ABV ℄
SHELL @ FR 38
SHELL @ FR 35
FR 35
DIESEL GEN SW STRAINER
P4L-2" (615C & 6MC)
P4ZA-2" (615C ONLY)
P2J-5"
P2K-5"
60'-0" FLAT
G-183 SEE REF #4
P2H-5"
P17D
P3Y-3"
ELEV VIEW "E-E"
LKG PORT
FR 41
"D"
"C"
DISCH SEA CHEST SEE REF #8
P2X-5"
CONT ON PLAN VIEW 33'-0" FLAT
FR 38
P1A-6"
Z-2
12'-0" OFF ℄ PORT (REF)
SUCT SEA CHEST SEE REF #7
P2B-5
V720
Z-4
P2D-5
P2C-5
CONT ON PLAN VIEW 33'-0" FLAT
FR 35
P2E-5
PLAN VIEW BELOW 33'-0" FLAT
P1Q-6"
FLEXIBLE JOINT
Z-2
F-1
V706
DIESEL GEN FWC HEAT EXCH
Z-2
P3R-3"
V705
P1P-6"
60'-0" FLAT
P17D
P3N-3"
FLEXIBLE JOINT
SECT VIEW "A-A"
FR 35 LKG FWD
SCALE: 3/4" = 1'-0"
P4M-2
V565 SET @ 75 PSIG
FLEXIBLE JOINTS
V707
T85 SEE REF #10
P5-1/2"
V708
P4S-2"
60'-0" FLAT
FR 43
FR 44
P4T-2"
CONT ON PLAN VIEW 33'-0" FLAT
ELEV VIEW "B-B"
LKG OUTBD
TOP OF TANK
FR 44
FR 41
FR 38
FR 35
CONT ON PLAN VIEW 60'-0" FLAT
P3N-3"
"D"
"C"
CONT ON PLAN VIEW 60'-0" FLAT

4002.65

MICRO-MASTER 105 mm

K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 2

10X

4002.66

CSD VAULT

E

REPRODUCTION OFFICE

YARD PRINTS YES

REMARKS

GROUPING YES

DATE 9-7-8

SIGNED

YARD PRINTS

ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS	REV.	C	C	A	A	C	A	A	B	B	A
	SHEET	1	2	3	4	5	6	7	8	9	10

PARTIAL ISSUE

NNS&DDCo. HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C	311		
614C	310		
613C	309	T11-S-116a	

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	Yes	Yes	NO

APPROVALS

OWNERS

ABS NR

USCG NR

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING

INSTALLATION GROUP 4002-0105-1208-SI
4002-0113-1206 PI
4002-0114-1207 PI
4002-0113-1205 SI

PIPE DETAIL 4002-67
PIPING ARR 4002-65

SCALE NONE =1 Ft.
DRAWN E.R. SMOOT
CHECKED TE SEAMAN
SECT. MGR. J H Johnson
DATE COMPL. 6-11-76
EXAMINED
AUTHORIZED E E Stephenson
DATE 6-11-76

TECH. APPROVAL NR
CSD APPROVAL R. L. Harrington

HULL 613C

TYPE OF DWG. ——

TITLE
PIPING ARR DIESEL GEN S.W. COOLING- LIST OF MAT'L

DWG. NO. 4002-66 +71 REV C SHEET NO. 1 OF 10

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D	OWNER DATE	OWNER APPD.
A	—	INITIAL ISSUE RJP	4/11/6	YMJ	—	—
B	9 8	ADDED LN 5. CRS LINE 1 CHG'D S/M FROM 6000-C7 (40) REC	6/16/7	AC		
C	5	ADDED LINE Nº 15. (WORK ACCOMP ON 613C BY LIAISON Nº 613C-JHJ-14)	9/7/8	YMY		

NOTES:

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF # 1.

NO.	REFERENCES	DWG. NO.
1	DIAG MN & AUX SEA WATER CIRC SYS - L/M	6550-360

HULL NO. 613C, 614C, 615C DWG. NO. 4002-66 REV. C SHEET 2 OF —

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P1A	6" IPS X.134" THK PIPE 90:10 CU-NI	PIPE DET 4002-67	PS	
	2	1	P2B	5" IPS X.125"			
	3	1	P2C				
	4	1	P2D				
	5	1	P2E				
	6	1	P2F				
	7	1	P2G				
	8	1	P2W				
	9	1	P2X				
	10						
	11						
	12	1	V-720	5" ANGLE STOP DUCTILE IRON 150# FLG	PO (19) 2280-C6	MD-PS	
	13						
	14	4	50WB1	5" BACKING RING 70:30 CU-NI	97-19-970	ST-PS	
	15						
	16	10	H-2	5" FIXED HANGER (¼" SYN RUBBER LINER)	MO 216691 S2 L16	ST-PS	
	17	2	H-7		S2 L17		
	18						

REMARKS -

SERVICE - DIESEL GEN S.W. COOLING

PS-165

GROUP NO. 4002-0105-1208 SI SHT 1 OF 2

APPLICABLE HULLS 613C 614C 615C

DWG NO. 4002-66 SHEET 3 REV. A

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	16			BOLTS	¾ HVY HEX HEAD L=1¾"	6000-C7 (24)	MD-PS	
	2	—	Z-1	6"	NUTS	—	—		
	3	—			GSKT	—	—		
	4	8			BOLTS	¾ HVY HEX HEAD L=3"	6000-C7 (22)	MD-PS	
	5	8	Z-2	6"	NUTS	¾ HVY HEX	6000-C11 (3)		
	6	1			GSKT	⅛ CLOTH INSERTED RUBBER 150#	15-02-246E	ST-PS	
	7	8			BOLTS	⅝ L=2¾"	6000-C7 (26)	MD-PS	
	8	8	Z-3	4"	NUTS	⅝	6000-C11 (2)		
	9	1			GSKT	⅛ 150#	15-02-244E	ST-PS	
	10	16			BOLTS	¾ L=2¾"	6000-C7 (40)	MD-PS	
	11	16	Z-4	5"	NUTS	¾	6000-C11 (3)		
	12	2			GSKT	⅛ 150#	15-02-245E	ST-PS	
	13				BOLTS				
	14		○		NUTS				
	15				GSKT				
	16				BOLTS				
	17		○		NUTS				
	18				GSKT				
	19				BOLTS				
	20		○		NUTS				
	21				GSKT				
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

REMARKS -

SERVICE - DIESEL GEN S.W. COOLING

PS-165

GROUP NO. 4002-0105-1208 SI SHT 2 OF 2

APPLICABLE HULLS 613C 614C 615C

DWG NO. 4002-66 SHEET 4 REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P3N	3" IPS X.109" THK PIPE 90:10 CU-NI	PIPE-DET 4002-67	PS	
	2	1	P1P	6" IPS X.134"			
	3	1	P1Q				
	4	1	P3R	3" IPS X.109"			
	5	1	P4T	2" IPS			
	6	1	P4U				
	7	1	P2V	5" IPS X.125"			
	8	24"	P5	½" IPS X.083"	PO (11) 6550-C5	MD-PS	
	9						
	10	1	V-566	½" ANGLE RELIEF BRONZE 200# SSUE (SENTINEL)(SET@75 PSIG)	PO (18) 6450-C7	MD-PS	
	11	1	V-705	4" BUTTERFLY 150# DUCTILE IRON	PIPE DET 4002-67	ST-PS	
	12	1	V-706	4"			
	13						
	14	1	4EB2	½" ELL 90° BRONZE SIL-BRZ FLAG FLOW 5101 OR =	25-27-144	ST-PS	
C	15	2	F-1	4" SPACER FLG 150# NI-CU	613C LIAISON Nº 613C-JHJ-14	PS	
	16	4	H-7	3" FIXED HANGER (¼" THK SYN RUBBER LINER)	MO 216691 S3 L1	ST-PS	
	17	4	H-7	2"	S3 L2		
	18	2	H-7	5"	S2 L17		

REMARKS -

SERVICE - DIESEL GEN S.W. COOLING

PS-161

GROUP NO. 4002-0113-1206-PI SHT 1 OF 2

APPLICABLE HULLS 613C 614C 615C

DWG NO. 4002-66 SHEET 5 REV. C

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	16			BOLTS	¾ HVY HEX HEAD L=3"	6000-C7 (22)	MD-PS	
	2	16	Z-2	6"	NUTS	¾ HVY HEX	6000-C11 (3)		
	3	2			GSKT	⅛ CLOTH INSERTED RUBBER 150#	15-02-246E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11		○		NUTS				
	12				GSKT				
	13				BOLTS				
	14		○		NUTS				
	15				GSKT				
	16				BOLTS				
	17		○		NUTS				
	18				GSKT				
	19				BOLTS				
	20		○		NUTS				
	21				GSKT				
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

REMARKS -

SERVICE - DIESEL GEN S.W COOLING

PS-161

GROUP NO. 4002-0113-1206-PI SHT 2 OF 2

APPLICABLE HULLS 613C 614C 615C

DWG NO. 4002-66 SHEET 6 REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P2H	5" IPS X.125" THK PIPE 90:10 CU-NI	PIPE DET 4002-67	PS	
	2	1	P2J				
	3	1	P2K				
	4	1	P3Y	3" IPS X.109" THK			
	5						
	6						
	7	2	H-7	5" FIXED HANGER (¼" THK SYN RUBBER LINER)	MO 216691 S2 L17	ST-PS	
	8	1	H-2	3"	S3 L3		
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - DIESEL GEN S.W. COOLING

PS-161

GROUP NO. 4002-0114-1207-PI SHT 1 OF 2

APPLICABLE HULLS 613C 614C 615C

DWG NO. 4002-66 SHEET 7 REV. A

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	16			BOLTS	¾" HVY HEX HEAD L=2¾"	6000-C12 (13)	MD-PS	
	2	16	Z-4	5"	NUTS	¾ HVY HEX	6000-C11 (3)		
	3	2			GSKT	⅛" CLOTH INSERTED RUBBER 150#	15-02-245E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11		○		NUTS				
	12				GSKT				
	13				BOLTS				
	14		○		NUTS				
	15				GSKT				
	16				BOLTS				
	17		○		NUTS				
	18				GSKT				
	19				BOLTS				
	20		○		NUTS				
	21				GSKT				
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

REMARKS -

SERVICE - DIESEL GEN S.W. COOLING

PS-161

GROUP NO. 4002-0114-1207-PI SHT 2 OF 2

APPLICABLE HULLS 613C 614C 615C

DWG NO. 4002-66 SHEET 8 REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P4L *	2" IPS X.109" THK PIPE 90:10 CU-NI	PIPE DET 4002-67	PS	
	2	1	P4M				
	3	1	P4S				
	4	90"	P5	½" IPS X.083" THK	PO (11) 6550-C5	MD-PS	
B	5	1	P42A ▲	2" IPS X.109" THK PIPE 90:10 CU-NI	PIPE DET 4002-67	PS	
	6						
	7	1	V565	½" ANGLE RELIEF BRONZE 200# SSUE (SENTINEL)(SET@75 PSIG)	PO (18) 6450-C7	MD-PS	
	8	1	V707	2" GLOBE STOP BRONZE 200# SSUE	PIPE DET 4002-67	PS	
	9	1	V708	2"			
	10						
	11						
	12	4	H-2	2" FIXED HANGER (¼" THK SYN RUBBER LINER)	MO 216691 S3 L4	ST-PS	
	13	2	H-1	½"	S3 L5		
	14						
	15						
	16						
	17						
	18						

REMARKS - * 613 & 614C ONLY
▲ 615C ONLY

SERVICE - DIESEL GEN S.W. COOLING

PS-168

GROUP NO. 4002-0113-1205-SI SHT 1 OF 2

APPLICABLE HULLS 613C 614C 615C

DWG NO. 4002-66 SHEET 9 REV. B

4002-66

MICRO-MASTER® 105 mm

K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

4002-66

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

FLANGED JOINT LIST & INSTALLATION GROUP
NN 3568

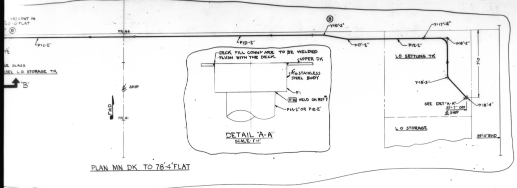
REV.	LINE	QTY. ■ SHIP	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	8			BOLTS	5/8" HVY HEX HEAD L=2¼	6000-C7 ㉘	MD-PS	
	2	8	Z-5	2"	NUTS	5/8" HVY HEX	6000-C11 ②	↓	
	3	2			GSKT	1/8" CLOTH INSERTED RUBBER 150	15-02-240E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

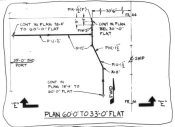
PS-168

SERVICE - DIESEL GEN S.W. COOLING

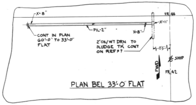
								GROUP NO.		4002-0113-1205-SI SHT 2 OF 2		
APPLICABLE HULLS	613C	614C	615C							DWG NO. 4002-66	SHEET 10	REV. A


(AR) CONT IN
60'-0" FLAT
Ⓑ
GE GLASS
ESEL L.O. STORAGE TK
"B"
FR 44
FR 41
℄ SHIP
FWD
P1C-2"
P1D-2"
Ⓑ
Y=16'-2"
Y=17'-2"
Y=17'-4"
P1E-2"
Y=18'-2"
LO SETTLING TK
7'-0
Y=18'-3"
SEE DET "A-A"
35'-7" OFF
℄ SHIP
Y=18'-4"
L O STORAGE
39'-0" BHD
DECK FILL CONN'S ARE TO BE WELDED FLUSH WITH THE DECK
UPPER DK
3/16 STAINLESS STEEL BODY
F1
P-14 WELD ON REF#5
P1A-2" OR P1E-2"
DETAIL "A-A"
SCALE: 1"=1'

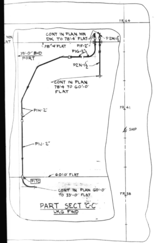
PLAN MN DK TO 78'-4" FLAT


P1K-1½(F)
30'-6"
FR 44
CONT IN PLAN 78-4" TO 60'-0" FLAT
P1W-2"
CONT IN PLAN BEL 30'-0" FLAT
P1J-2"
X=12"
P1K-1½"
39'-0" BHD PORT
℄ SHIP
P1U-1½"
X=8"
CONT IN PLAN 78'-4 TO 60'-0" FLAT
FWD
"E"
FR 41
"E"

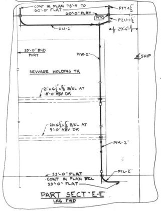
PLAN 60'-0" TO 33'-0" FLAT


X=8"
FR 44
X=11"
P1L-2"
X=8"
CONT IN PLAN 60'-0" TO 33'-0" FLAT
2" OIL/WT DRN TO SLUDGE TK CONT ON REF#7
17'-5"
℄ SHIP
FWD
FR 42

PLAN BEL 33'-0" FLAT


FR 44
CONT IN PLAN MN DK TO 78'-4" FLAT
P2M-1½"
78'-4" FLAT
P1F-2"
P1G-2"
39'-0" BHD PORT
P2N-1½"
CONT IN PLAN 78'-4 TO 60'-0" FLAT
P1H-2"
FR 41
℄ SHIP
P1J-2"
60'-0" FLAT
P1TC
CONT IN PLAN 60'-0" TO 33'-0" FLAT
FR 38

PART SECT "C-C"
LKG FWD


CONT IN PLAN 78'-4 TO 60'-0" FLAT
P1T-1½"
60'-0" FLAT
P1TC
P2U-1½"
P1J-2"
29'-6"
39'-0" BHD PORT
P1W-2"
℄ SHIP
SEWAGE HOLDING TK
21"x6½"x⅝" B/UL AT 18'-0" ABV DK
21x6½"x⅝" B/UL AT 9'-0" ABV DK
P1K-2"
P1L-2"
33'-0" FLAT
CONT IN PLAN BEL 33'-0" FLAT

PART SECT "E-E"
LKG FWD

REVISIONS						
REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHO	OWNER DATE	OWNER APPD
A	–	INITIAL ISSUE	3/2/77	[illegible]	–	–
B	-	ALTERED "Y" DIMENSIONS ON PIPES P1B-2", P1C-2", P1D-2" & P1E-2".	9/21/77	AC [illegible]	–	–
C	–	ADDED 1" DRAIN FOR DRIP COMING UNDER AUX DIESEL GEN L.O. TANK			–	–
	-	ADDED CUT-OUT VALVE FOR DIESEL LO STORAGE TK FILLING LINE LAM	6/28/78	AC [illegible]		
	-	ADDED F4 FOR HOLECUT IN 78'-4" FLAT FOR P1G-2 & P2N-1½ LAM			–	-
D	-	ALT'D LO FILL CONN PORT WAS LOC 7'-0" AFT FR44				
	–	PLAN 78'-4" TO 60'-0" FLAT ALT'D OFF & DIMENSION FOR P2T-1½ LAM	9/11/78	AC [illegible]		
		WORK ACCOMPLISHED ON H-G13C				

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REF#1 & 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REF#2 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE USCG, ABS AND REF#5.
4. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS: BUTT WELDS ARE P-3, SOCKET WELDS P14 AND SLIP-ON FLANGES P-16A ON REF#5 UNLESS OTHERWISE NOTED.
5. ALL PIPING ON THIS ARRANGEMENT IS CLASS II.
6. ALL HOLECUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.
7. PIPE SIZES SPECIFIED ARE NOMINAL IPS OUTSIDE DIAMETERS.
8. BACKING RINGS & COUPLINGS ORDERED ON LIST OF MATERIAL ARE TO BE USED AS REQUIRED.
9. HANGERS ORDERED ON LIST OF MATERIAL ARE TO BE USED AS REQUIRED AND ARE TO BE INSTALLED IN ACCORDANCE WITH REF#6 UNLESS OTHERWISE NOTED.
10. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT, "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT
11. LOCATION DIMENSIONS ARE REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
12. CARE IS TO BE TAKEN THAT PIPE, BRACKETS AND HANGERS DO NOT INFRINGE ON THAT SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS PUMPS AND ETC.
13. PAINTING IS TO BE IN ACCORDANCE WITH REF#4
14. TESTS ARE TO BE IN ACCORDANCE WITH REF#2.
15. THIS SYSTEM REQUIRES SPECIAL CLEANING SEE REF#3, EXCEPT FOR DRAINS TO SLUDGE TANK.

FOR LIST OF MAT'L SEE
NN DWG 4002-73

NNS&DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
G15C	311	
G14C	310	
G13C	309	

APPROVALS		
OWNERS	ABS	NR
	USCG	NR

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERIAL SHIP ENGINEERING
FSCM NO. 43689

NO.	REFERENCES	DWG NO.
7	PIPING ARR OIL/WT SEPARATOR FOR BILGE SYS	2280-715
6	STD PIPE HANGERS & INSTALLATION INSTRUCTIONS	257056
5	FAB & WELDING INSTRUCTIONS FOR CL I & II PIPING	257035
4	PAINTING SCHEDULE 613 & 614 615	8300-40 8300-41
3	PROCEDURE FOR CLEANING LO SYS	6200-608
2	DIAG MN LO SYS L/M	6200-610
1	DIAG MN LO SYS ARR	6200-609

SCALE ½ = 1 FT
DRAWN L.A. McNEIL
CHECKED H.M. EDGE
SECT MGR J. H. Johnson
DATE COMPL. 2-25-77
EXAMINED
AUTHORIZED E F Stephenson
DATE 2-25-77
TECH APPROVAL NR
C S D APPROVAL R. L. Harrington

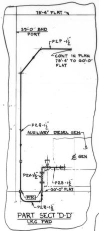
PIPING ARR DIESEL GENERATOR L.O. FILL PLAN, SECT & ELEV

U S M A DESIGN T11-S-116a
U S M A DWG NO.
HULL NO.
DWG NO. 4002-72
REV D
SHEET NO. 1 OF 1

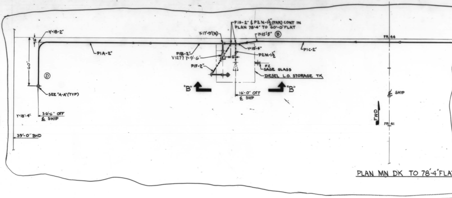
REPRODUCTION OFFICE
YARD PRINTS YES NO
REMARKS
DATE 9-15-78
GROUP: MC NO.

4002-72

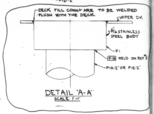
SEPT. '80
FRAME 1
10X


78'-4" FLAT
39'-0" BHD PORT
P2P-1½"
CONT IN PLAN 78'-4" TO 60'-0" FLAT
P2Q-1½"
AUXILIARY DIESEL GEN
℄ GEN
P2V-1½"
P2S-1½"
60'-0" FLAT
P1TC
P2R-1½"

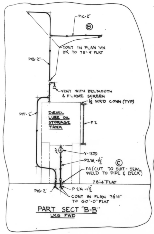
PART SECT "D-D"
LKG FWD


Y-18-2"
P1A-2"
P1G-2" & P2N-1½" (FAR) CONT IN PLAN 78'-4" TO 60'-0" FLAT
X-17-9"(N)
Y-15'-5"
Y-15-4"
P1B-2"
V1277 Y-9'-6"
P1F-2"
P2M-1½"
F2 GAGE GLASS
DIESEL L.O. STORAGE TK
P1C-2"
P1D-2"
FR 44
SEE "A-A" (TYP)
36'-6" OFF ℄ SHIP
16'-0" OFF ℄ SHIP
Y-18'-4"
39'-0" BHD
"B"
"B"
℄ SHIP
FWD
FR 41

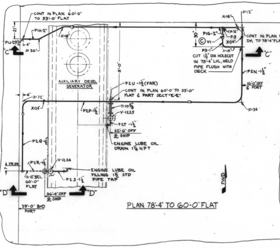
PLAN MN DK TO 78'-4" FLAT


DECK FILL CONN'S ARE TO BE WELDED FLUSH WITH THE DECK
UPPER DK
3/16 STAINLESS STEEL BODY
P-14 WELD ON REF 5
F1
P1A-2" OR P1E-2"

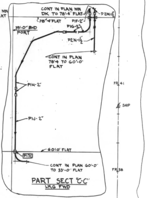
DETAIL "A-A"
SCALE 1"=1'


P1C-2"
P1B-2"
CONT IN PLAN MN DK TO 78'-4" FLAT
VENT WITH BELLMOUTH & FLAME SCREEN
¾ SCR'D CONN (TYP)
P1F-2"
DIESEL LUBE OIL STORAGE TANK
F2
Y-1270
P2M-1½"
F4 (CUT TO SUIT - SEAL WELD TO PIPE & DECK)
78'-4" FLAT
P1G-2"
P2N-1½"
CONT IN PLAN 78'-4" TO 60'-0" FLAT

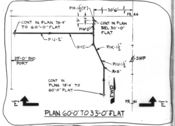
PART SECT "B-B"
LKG FWD


CONT IN PLAN 60'-0" TO 33'-0" FLAT
P1H-2"
P1J-2"
X-30"
X-18"
X-12"
P1G-2"
P3-1
F-3
X-34"
CUT 1½" DIA HOLECUT IN 78'-4" LVL, WELD PIPE FLUSH WITH DECK
CONT IN PLAN MN DK TO 78'-4" FLAT
"C"
"C"
AUXILIARY DIESEL GENERATOR
P2U-1½" (FAR)
CONT IN PLAN 60'-0" TO 33'-0" FLAT & PART SECT "E-E"
P2N-1½"
16'-0" OFF ℄ PORT
X-72"
X-34"
P2P-1½"
Y-10⅝
V-1225
P2T-1½"
32'-6" OFF ℄ SHIP
ENGINE LUBE OIL DRAIN 1¼ NPT
P2Q-1½"
FR 39
P2R-1½"
V-1224
X-12 BEL 60'-0" FLAT
P2S-1½"
ENGINE LUBE OIL FILLING 1½ STD PIPE TAP
"D"
"D"
36'-4" OFF ℄ SHIP
39'-0" BHD PORT
FWD

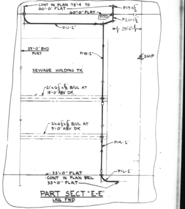
PLAN 78'-4" TO 60'-0" FLAT


CONT IN PLAN MN DK TO 78'-4" FLAT
78'-4" FLAT
P1F-2"
P2M-1½"
39'-0" BHD PORT
P1G-2"
P2N-1½"
CONT IN PLAN 78'-4" TO 60'-0" FLAT
P1H-2"
P1J-2"
60'-0" FLAT
P1TC
CONT IN PLAN 60'-0" TO 33'-0" FLAT
FR 44
FR 41
℄ SHIP
FR 38

PART SECT "C-C"
LKG FWD


P1K-1½" (F)
30'-6"
FR 44
CONT IN PLAN 78'-4" TO 60'-0" FLAT
CONT IN PLAN BEL 30'-0" FLAT
P1W-2"
P1J-2"
X-12"
P1K-1½"
39'-0" BHD PORT
℄ SHIP
P1U-1½"
X-8"
CONT IN PLAN 78'-4" TO 60'-0" FLAT
FWD
FR 41
"E"
"E"

PLAN 60'-0" TO 33'-0" FLAT


CONT IN PLAN 78'-4" TO 60'-0" FLAT
60'-0" FLAT
P1TC
P1T-1½"
P2U-1½"
P1J-2"
29'-6"
39'-0" BHD PORT
P1W-2"
℄ SHIP
SEWAGE HOLDING TK
21 x 6½ x ⅝ B/UL AT 18'-0" ABV DK
21 x 6½ x ⅝ B/UL AT 9'-0" ABV DK
P1K-2"
P1L-2"
33'-0" FLAT
CONT IN PLAN BEL 33'-0" FLAT

PART SECT "E-E"
LKG FWD

4002-72

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 2
10X

4002-73 CSD VAULT

E

4002-73

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 6-24-8
SIGNED

YARD PRINTS — ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS					
REV.	C	C	C	C	C
SHEET	1	2	3	4	5

GROUP
MC NO.

NNS&DDCo HULL No.	WAMAD HULL No.	USMA DESIGN
615C	311	
614C	310	
613C	309	T11-116a

SHIP'S NAME

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES

APPROVALS
OWNERS
ABS NR
USCG NR

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING

ARR DWG Nº 4002-72
PIPE DET DWG Nº 4002-74
INSTALLATION GROUP Nº 4002-0119-1001PI
4002-0117-1001 SI

SCALE NONE =1 Ft.
DRAWN L.A. MCNEIL
CHECKED H.M. EDGE
SECT. MGR. J.H. Johnson
TECH. APPROVAL NR
DATE COMPL. 2-25-77
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 2-25-77
CSD APPROVAL R.L. Hannigh

HULL 613C GROUP NO. KEY PART COMP. DATES BY CHK. GROUPED

TYPE OF DWG. —

TITLE
PIPING ARR DIESEL GENERATOR
L.O FILL LIST OF MAT'L

DWG. NO. 4002-73 REV C SHEET NO. 1 OF 5

MS 8½ X 14

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D	OWNER DATE	OWNER APPD.
A	—	INITIAL ISSUE	2/25/77	JHJ	—	—
B	3	S/M ALTD FOR F1	8/1/77	JHJ	—	—
C	4 5	ADDED LINE 15. ADDED LINES 2&4.			—	—
	3	ADDED LINE 13 ERS LAM	4/24/78	JK		
	5	ADDED LINE 3 LAM	8	JHJ		

NOTE

1. FOR ADDITIONAL INFORMATION ON MATERIAL SEE REF#1.

NO.	REFERENCES	DWG. NO.
1	DIAG MN LO SYS L/M	6200-610

DIESEL GEN L.O. FILL
HULL NO. 613C, 614C, 615C
DWG. NO. 4002-73
REV. C SHEET 2 OF —

447

MN46 8½ X 14

GROUP

REV.	LINE NO.	QTY. 1 SHIP	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	PIA	2" IPS x STD THK STL PIPE	PMO 4002-74	PS	
	2	1	PIB				
	3	1	PIC				
	4	1	PID				
	5	1	PIE				
	6						
	7						
	8						
	9						
	10	2	F1	2" DK FILL CONN	PO 608C ② 2285-C5 PO 613C ① 6200-C13	MD-PS	
	11						
	12						
C	13	1	V1277	2" GATE VALVE, SW, STL, 600#	PO ⑤ 6200-C9	ST-PS	
	14						
	15						
	16						
	17						
	18						

REMARKS –

SERVICE - DIESEL GEN LO FILL
PS-155
GROUP NO. 4002-0119-1001 PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C 615C
DWG NO. 4002-73 SHEET 3 REV. C

GROUP

REV.	LINE NO.	QTY. 1 SHIP	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	PIF	2" IPS x STD THK STL PIPE	PMO 4002-74	PS	
	2	1	PIG				
	3	1	PIH				
	4A	1	PIJ				
	4B	1	PIW				
	5A	1	PIK				
	5B	1	PIL				
	6	1	P2M	1½ IPS x STD THK STL PIPE			
	7	1	P2N				
	8	1	P2P				
	9	1	P2Q				
	10	1	P2R				
	11	1	P2S				
	12	1	P2T				
	13	1	P2U				
	14	1	P2V				
C	15	72"	P3	1" IPS x STD THK STL PIPE	S/ 57-06-104		
	16	1	V-1224	1½" GLOBE STOP 600# SW STL	PMO 4002-74	PS	
	17	1	V-1225				
	18	1	V-1270				

REMARKS –

SERVICE - DIESEL GEN L.O. FILL
PS-164
GROUP NO. 4002-0117-1001 SI SHT 1 OF 2
APPLICABLE HULLS 613C 614C 615C
DWG NO. 4002-73 SHEET 4 REV. C

GROUP

REV.	LINE NO.	QTY. 1 SHIP	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	F2	¾ GAGE GLASS SCR'D	PO ⑭ 6552-C5	MD-PS	
C	2	1	F3	BOSS, STEEL S.W	S/ 25-02-226	ST-PS	
C	3	1	F4	¼x12x12 STL PLATE	FURN. BY X42	—	
C	4	1	V-1	1" SWING CHECK VALVE SCR'D BRONZE 125#	S/ 26-07-168	ST-PS	
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS –

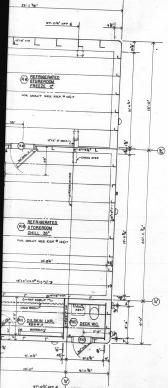
SERVICE - DIESEL GEN L O FILL
PS-164
GROUP NO. 4002-0117-1001 SI SHT 2 OF 2
APPLICABLE HULLS 613C 614C 615C
DWG NO. 4002-73 SHEET 5 REV. C

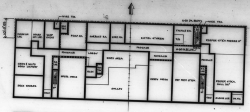
MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X


63'-0⅛" OFF ℄
23'-11 ⅜"
57'-0⅛" OFF ℄
9⅜"
12"×6" TYP.
R8 REFRIGERATED STOREROOM FREEZE 0°
FOR ARRG'T. SEE REF. # 12 & 17
15'-0"
12'-0½"
12"×6" AT DECK
CASING OVER
GIRDER OVER
R9 REFRIGERATED STOREROOM CHILL 35°
FOR ARRG'T. SEE REF. # 12 & 17
14'-8¼"
18"×4"×15.3# FLG. PLT.
19'-9 7/16"
20'-11 7/16"
C-HAT SHELF
JACK ROD
R11 OILSKIN LKR.
REF. # 17
BOOTRACK
R10 DECK W.C.
6'-0"
4'-6"
9'-0½"
10'-0"
5'-2⅝"
5'-11¾"
57'-0⅛" OFF ℄

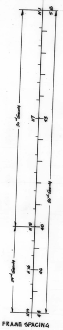

WIRE TRK.
A-60 DK. BLKH.
CLEAN UP LKR.
SOILED LIN. LKR.
SLOP CHEST
FOAM RM.
GYRO RM.
HOTEL STORES
CHANGE RM.
T/S
FREEZER STRM. FREEZE 0°
PASSAGE
LOBBY
SERV. AREA
A-60 DK. BELOW
CREW & SHIPS SERV. LAUNDRY
OFCRS. MESS
ELEV.
GALLEY
CREW MESS
DRY PROV. STRM.
REEFER STRM. CHILL 35°
DECK STORES
VEST
OILSKIN LKR.
DK. W.C.

- ▬ A-60 CLASS
- ▬ A CLASS
- ▨ B CLASS
- — C CLASS
- ▥ DRAFTSTOP

BULKHEAD DESIGNATION PLAN

3/32" = 1'-0"

NOTES:
1. ALL DECK AREA IS "A" CLASS UNLESS OTHERWISE NOTED.
2. ALL PENETRATIONS THROUGH DECK OR SHELL BULKHEADS ARE TO BE WATERTIGHT.


HOPEMAN FRAME
SHIP FRAME
H1
58
30" SPACING
H7
53
H8
48
34" SPACING
H16
46
24" SPACING
H19
41

FRAME SPACING

ELECTRICAL SYMBOLS

- ☒ SWITCH, FLUSH MOUNTED IN DOOR JAMB OR BULKHEAD
- ■ SWITCH, SURFACE MOUNTED
- ▣ RECEPTACLE, SINGLE OR DUPLEX
- ● RADIO AND TV OUTLET
- ◡ EXTERIOR LIGHT
- ⊕ AUTO DIAL PHONE, BULKHEAD MOUNTED
- ⊕ SOUND POWERED PHONE, BULKHEAD MOUNTED
- Ⓒ CLOCK, BULKHEAD MOUNTED
- Ⓖ GENERAL ALARM BELL
- ▣ THERMOSTAT

LIST OF ABBREVIATIONS

A.C.	ARM CHAIR
C.D.	CHEST OF DRAWERS
D.L.	DROP LEAF DESK
D.F.	DRINKING FOUNTAIN
LKR.	LOCKER
L.S.	LAUNDRY SINK
S.B.	SIDEBOARD
S.C.	SIDE CHAIR
S.S.	SERVICE SINK
T.C./L.	TOILET CABINET W. LIGHTS
VEST.	VESTIBULE
I.B.	IRONING BOARD
F.D.	FIRE DOOR
W.D.	WEATHERTIGHT DOOR
D.C.	DAMAGE CONTROL
B.P.	BOLTED PLATE
V.L.	VERTICAL LADDER
L.	BULKHEAD MOUNTED LIGHT
M.	MIRROR
S.	SHELF
A.P.	ACCESS PANEL
A.R.	ART REPRODUCTIONS

RESERVATIONS

~~1. ARRANGEMENT OF GYRO ROOM PENDING RECEIPT OF REF. # 19.~~
~~2. ARRANGEMENT OF FOAM ROOM PENDING RECEIPT OF REF. # 18.~~

REVISIONS

REV	ZONE	DESCRIPTION	N.N.S.&D.D.CO. DATE	N.N.S.&D.D.CO. AUTHD	OWNER DATE	OWNER APPD
0		INITIAL ISSUE.	3-4-77	ELH	2-3-77	SHELL
A	4B,C 8B,C	1. ADDED WEB STIFFENERS TO H1 & H7, 57'-0⅛" OFF ℄ P/S, AND DELETED LONG'L. GIRDER AT SAME LOCATION.				
	8B	2. REVISED DOOR R26 AND RELOCATED 60# DRYER AFT, ALL TO SUIT ITEM # 1.				
	4&8B	3. FR. 9 TOED AFT.				
	5C	4. REVISED STEEL CUT SIZE AND LOCATION IN STAIR R7. REVISED LONG'L. STL. BHDS. P/S OF SAME. (PER DEV. W/ N.N.)				
	5C	5. REVISED FIRE STATIONS 29 & 30 I.W.O. A-60 INSULATION.				
	7A	6. REVISED DOOR R17 TO AGREE W. REF. # 14.				
	6C	7. RELOCATED PUMP RM. LIGHT RECESSES FOR BETTER ACCESS (P/S).				
	4,8A,C	8. ADDED EXTERIOR LIGHTS P/S.				
	—	9. SPACE DIMENSIONS REVISED TO SUIT INCREASE OF THICKNESS OF H7 BHD.				
	8A,4A	10. H13 BHD (P) & H16 BHD (S) MOVED FWD 14".				
	2D	11. DRAFTSTOP ADDED TO BHD. DESIG. PLAN.				
	5A	12. DELETED A&G HOLDBACK AT DOOR R15 TO SUIT VENTILATION REQUIREMENTS.				
	4,7A,B	13. ADDED ART REPRODUCTIONS TO MESS RM'S.				
	7D	14. RELOCATED DOOR R29 TO SUIT REF. # 18.				
	7C	15. REVISED SPACE R28 TO SUIT REF. # 18.				
		16. ADDED POWER PANELS AT C.G. LOCKER AND H7 BHD., 10'-6" PORT OF ℄.				
	1A	17. ADDED REFERENCE 20.				
	7C	18. REVISED ACCESS TO PORT WIRING TRUNK.				
	6C	19. ADDED GYRO ROOM ARRANGEMENT.				
	2D	20. REVISED AFT BULKHEAD OF FOAM ROOM TO "A" CLASS FROM "A-60" CLASS.				
	1B	21. ADDED OWNER AND N.N. APPROVALS.				
B	—	1. ADDED BULLETIN BOARDS TO MESSROOMS.				
	—	2. REVISED ARRG'T. OF LOCKERS TO AGREE W/ REF. # 17.				
	VAR.	3. ADDED INT. STORMRAIL TO AGREE W/ REF. # 2.				
	6D	4. REVISED LOCATION OF POWER PANEL IN SERVING AREA TO CORRECT.				
	4-C	5. ADDED WIREWAY IN RM. R4				
	8C	6. REVISED LKR. R4 FWD. BHD. SHEATHING AT 10'-6" OFF ℄ STBD. TO SUIT REF. 21				
	1A	7. ADDED REF. 21				
	7B	8. ADDED STORMRAIL TO PANTRY AREA, PORT.				
	8&C	9. REVISED STBD. FWD. PASSAGE I.W.O. ELECTRIC & MANUAL CONTROL STATIONS TO SUIT DESIGN DEVELOPMENTS.				
C	6C	1. REVISED SHELVING IN R-4 TO SUIT REF. # 21.				

AUTHORITY:

GENERAL NOTES:

1. ALL MATERIALS FOR BULKHEADS, LININGS, CEILINGS, AND INSULATION SHALL BE APPROVED INCOMBUSTIBLE IN ACCORD WITH EQUIPMENT LISTS C.G. #190.

NO.	REFERENCES	DWG NO.
21.	MAIN WIREWAY ARRANGEMENT CAMBER DK.	4700-1085
20.	GARBAGE COMPACTOR ROOM ARRG'T. & DETAILS	7500-387
19.	LATER (FROM N.N.)	LATER
18.	FOAM SYSTEM	2400-986
17.	STOREROOMS AND LOCKERS	7700-554
16.	LAUNDRIES ARRANGEMENT & DETAILS	7600-459
15.	JOINER INSULATION	7000-110
14.	GALLEY ARRANGEMENT	7500-364
13.	DECK COVERING ARRGT. & DETAILS	5500-102
12.	SHIP'S REEFER STOREROOM ARR'GT. & DETS.	5460-141
11.	WINDOW LIST	5400-53
10.	FURNITURE SCHEDULE	5300-549
9.	WARDROBE ARRANGEMENT & DETAILS	5250-67
8.	INTERIOR JOINER DOORS	5250-65
7.	EXTERIOR JOINER DOORS	5250-64
6.	WINDOW CASINGS	5200-78
5.	TYPICAL JOINER DETAILS	5200-75
4.	CEILING ARRANGEMENT CAMBER DK.	5200-68
3.	JOINER STAIRS ARR'GT. & DETAILS	5100-12
2.	INTERIOR STORM RAILS ARRGT. & DETAILS	5100-13
1.	LIGHTING SYSTEM ARR'GT. & DETS. CAMBER DK.	4200-1371

NNS & DD CO HULL NO.	MARAD HULL NO.
614 613	310 309

SHIPS NAME

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS

OWNERS: SHELL LTR. 1402V OF 2-3-77 G.K. Sumner
NNS&DDCo. LTR. 6134/H5200 OF 3-4-77 R.L. Harrington
ABS: N.A.
US PHS: 11-26-76 G.R. Ramirez
USCG: 12-10-76 J.D. Vittauskas

Newport News Shipbuilding
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DESIGN DIV.
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

H.B. DWG NO. 5200-61
SHT. 1 OF 1

SCALE 3/8" = 1 FT
DRAWN E.P. Acosta
CHECKED H.K.
SECT MGR J. T. Cagato
TECH APPROVAL
DATE COMPL. 9-20-76
EXAMINED T.T. Taylor
AUTHORIZED E.E. Stephenson
DATE 3-29-77
CSD APPROVAL R.L. HARRINGTON

JOINER ARRANGEMENT
CAMBER DECK

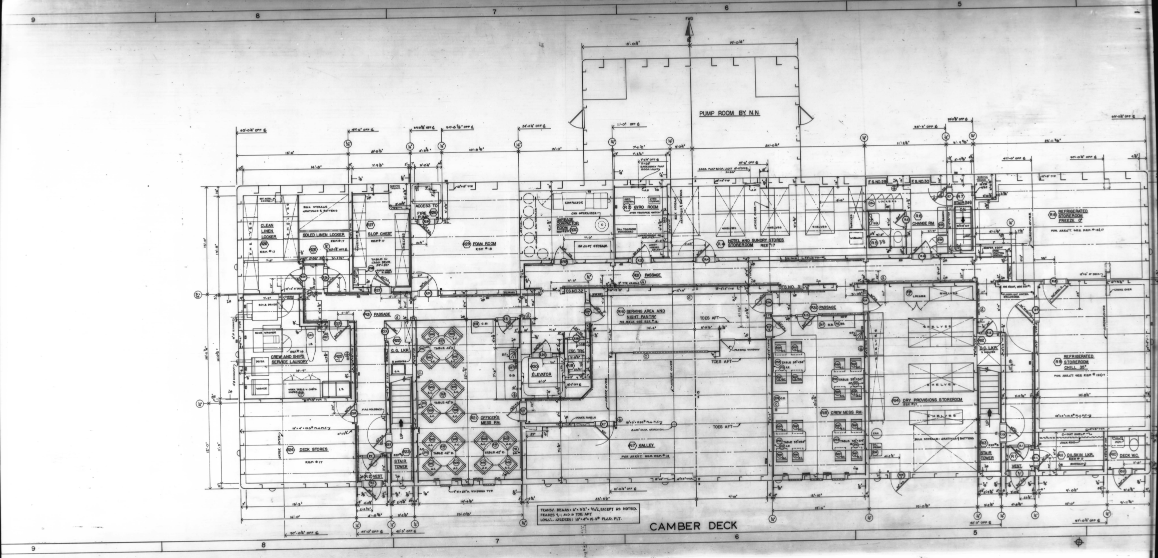
USMA DESIGN T 11-S-116a
USMA DWG NO.
HULL NO. 613, 614

DWG NO. 5200-61
REV C1
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS
ORDERED BY DESIGN
GROUP:
MC NO.

5200-61

MICRO-MASTER 105 mm
K+E
SEPT. '80
FRAME 1
10X


FWD
PUMP ROOM BY N.N.
CLEAN LINEN LOCKER R26 REF. #17
BULK STORAGE GRATINGS & BATTENS
SOILED LINEN LOCKER R26 REF. #17
SLOP CHEST R27 REF. #17
TABLE W. CASH DRWR. 24" x 24"
ACCESS TO FIRE PUMP R28
R29 FOAM ROOM REF. #18
GARBAGE COMPACTOR ROOM R30 REF. #20
COMPACTOR
CAN STERILIZER
GARBAGE CAN STORAGE
50 CU.FT. STORAGE
R3 GYRO ROOM
GYRO COMPASS
GYRO TRANSFER SWITCH
DIAL TELEPHONE SWITCHBOARD
ENTERTAINMENT SYS. AMPLIFIER
ASSIST NEEDED RELAY
EMERGENCY PUMP ROOM LIGHT
R4 HOTEL AND SUNDRY STORES STOREROOM REF. #17
SHELVES
GIRDER OVER
F.S. NO. 29
F.S. NO. 30
F.S. NO. 31
F.S. NO. 32
LOCKERS
R5 T/S
R6 CHANGE RM.
R7 STAIR (NN) DN
WIRING TRUNK
REEFER EQUIP.
FIRE FIGHTING STATION
R8 REFRIGERATED STOREROOM FREEZE 0°
FOR ARR'G'T. SEE REF. #12 & 17
R31 PASSAGE
CREW AND SHIP'S SERVICE LAUNDRY REF. #16 R25
50 LB. DRYER
50 LB. WASHER
DRYER
WASHER
WORK TABLE W. CAB'TS. UNDER
L.S.
L.B.
R22 C.G. LKR.
3 SHELVES
R23 STAIR TOWER REF. #3
UP
R2 VEST.
MAG. HOLDBACK
R24 DECK STORES REF. #17
18" x 4" x 15.3# FLG. PLT.
R21 OFFICER'S MESS RM.
TABLE 42" D.
A.C.
C.D.
S.B.
D.F.
R20 ELEVATOR
ESC. TRK.
R16 SERVING AREA AND NIGHT PANTRY FOR ARR'G'T. SEE REF. #14
TOES AFT
PASSING WINDOW
POWER PANELS
8.625" DIA. STANCHION
R17 GALLEY FOR ARR'G'T. SEE REF. #14
R15 CREW MESS RM.
TABLE 33" x 54"
S.C.
A.E.
R14 DRY PROVISIONS STOREROOM REF. #17
LOCKER
BULK STORAGE - GRATINGS & BATTENS
CAN
R12 D.C. LKR. 3 SHELVES
FLOODLIGHT CONTROL ENCLOSURE
CASING OVER
R9 REFRIGERATED STOREROOM CHILL 35° FOR ARR'G'T. SEE REF. #12 & 17
R13 STAIR TOWER REF. #3
R1 VEST.
R11 OILSKIN LKR. REF. #17
HAT SHELF
JACK ROD
BOOTRACK
R10 DECK W.C.
17" W x 26" H. WINDOWS TYP.
TRANSV. BEAMS: 6" x 3 1/2" x 5/16" L, EXCEPT AS NOTED.
FRAMES 9, 11, AND 13 TOE AFT.
LONG'L. GIRDERS: 18" x 4" x 15.3# FLGD. PLT.
CAMBER DECK
9
8
7
6
5

5200-61

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

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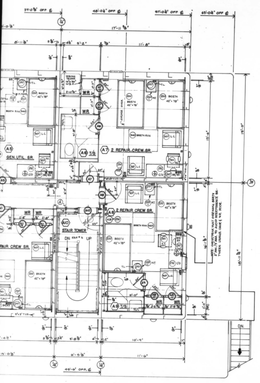
SEPT. '80

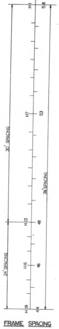
FRAME 2

10X

S TYPICAL

N FORWARD WINDOWS TYPICAL.





FRAME SPACING

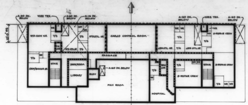
LIST OF ABBREVIATIONS

A.P.	ACCESS PANEL
B.P.	BOLTED PLATE
B.S.	BERTH SHELF
BR/RS	BOOKRACK/RADIO SHELF
C/D	CHEST/DESK
D.F.	DRINKING FOUNTAIN
E.T./CABT.	END TABLE W. CABINET UNDER
F.C.	FILE CABINET
F.D.	FIRE DOOR
L.	BERTH LIGHT
L.C.	LOUNGE CHAIR
LKR.	LOCKER
L.P.	LIFE PRESERVER
M.L.	MEDICINE LOCKER
N.T.	NIGHT TABLE
RFRG.	REFRIGERATOR
RFRG/NT.	REFRIGERATOR/NIGHT TABLE
S.C.	SIDE CHAIR
S.S.	SERVICE SINK
T.C./L.	TOILET CABINET W. LIGHTS
T.L.	TABLE LAMP
T/S	TOILET AND SHOWER SPACE
T.W.	TYPEWRITER
W.B.	WASTEBASKET
W.D.	WEATHERTIGHT DOOR
W.R.	WARDROBE
V.L.	VERTICAL LADDER

RESERVATIONS

ELECTRICAL SYMBOLS

⊠	SWITCH, FLUSH MOUNTED IN DOOR JAMB OR BULKHEAD
■	SWITCH, SURFACE MOUNTED
▤	RECEPTACLE, SINGLE OR DUPLEX
◐	RADIO AND TV OUTLET
◡	BERTH LIGHT/DESK LIGHT/EXTERIOR LIGHT
⊕	DESK TOP LIGHT
⊕⊕	AUTO DIAL PHONE, DESK/BULKHEAD MOUNTED
⊕	SOUND POWERED TELEPHONE
Ⓖ	GENERAL ALARM BELL
Ⓒ	CLOCK, BULKHEAD MOUNTED
⊡	THERMOSTAT



BULKHEAD DESIGNATION PLAN

3/32" = 1'-0"

▬	A-60 CLASS
▬	A CLASS
▬	B CLASS
—	C CLASS
● ● ● ●	SOUNDSTOP
▥	DRAFTSTOP

NOTES:
1. ALL DECK AREA IS "A" CLASS UNLESS OTHERWISE NOTED.
2. ALL SHELL BULKHEADS AND DECKS EXPOSED TO WEATHER ARE WATERTIGHT CONSTRUCTION.

REVISIONS

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHO	OWNER DATE	OWNER APPD
0		INITIAL ISSUE.			2-3-77	SHELL
A	1A VAR. 7B B4 B4 D6 2D 4A 4B 1B	1. ADDED REFERENCE 16. 2. GENERALLY REVISED FURNITURE SYMBOL NO'S TO AGREE W. REF. # 11. 3. MOVED DARKROOM SHELF INBOARD 6". 4. DELETED MAGNETIC HOLDBACK AT DOOR A10 TO SUIT VENTILATION REQ'MENTS. 5. INCREASED DEPTH OF ENTRY VESTIBULE IN REPAIR CREW SR. A7. 6. REVERSED SWING OF DOOR A16 TO AVOID DUCTWORK. 7. ADDED DRAFTSTOP TO BULKHEAD DESIGNATION PLAN TO SUIT C.G. REQ'S. 8. RELOCATED WR'S IN A8 APT TO AVOID INTERFERENCE AT LOUNGE CHAIR. ADDED NOTE. 9. DELETED L.P. RACK IN SR. A7. 10. ADDED SHELL APPVL. OF REV. O. (5-16-77)	6-23-77	RLH	5-31-77	ZAPATA
B	6A-C	1. ADDED WORK TABLE TO AFT BULKHEAD OF CARGO CONTROL ROOM A1.				
C	VAR. 6B	1. ADDED READING LT. SWITCHES AND READING LIGHTS TO STATEROOMS. 2. DELETED CLOCK IN LIBRARY (PER N.N.)				
D	4B	1. RELOCATED EXT. RECEPTACLE 2' FWD. TO CLEAR INTERFERENCE.				

AUTHORITY:

GENERAL NOTES:

1. ALL MATERIALS FOR BULKHEADS, LININGS, CEILINGS, AND INSULATION SHALL BE APPROVED INCOMBUSTIBLE IN ACCORD WITH EQUIPMENT LISTS C.G. # 190.

NO.	REFERENCES	DWG NO.
16.	RAILS AND STANCHIONS FR. 44-58	3300-168
15.	STOREROOMS AND LOCKERS	7700-554
14.	JOINER INSULATION	7000-110
13.	DECK COVERING ARR'G'T. AND DETAILS	5500-102
12.	WINDOW LIST	6400-63
11.	FURNITURE SCHEDULE	5300-549
10.	WARDROBE ARRANGEMENT AND DETAILS	5260-67
9.	INTERIOR JOINER DOORS	5250-65
8.	EXTERIOR JOINER DOORS	5260-64
7.	WINDOW, CASINGS	5200-78
6.	TYPICAL JOINER DETAILS	5200-75
5.	CEILING ARRANGEMENT - "A" DECK	5200-69
4.	INTERIOR STORM RAILS; ARR'G'T. AND DETAILS	5100-13
3.	JOINER STAIRS, ARRANGEMENT AND DETAILS	5100-12
2.	LIGHTING SYSTEM ARRANGENT. "A" DK.	4200-1367
1.	VENTILATION ARR'G'T., FAN ROOMS ARR'G'T. & DETS.	2680-601

NNS & DD CO HULL NO	MARAD HULL NO	SHIPS NAME
615	311	
614	310	
613	309	

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS

OWNERS SHELL LTR 1405V 2-3-77 [illegible]
ZAPATA LTR 5-31-77 D.F. Bonn
ABS NA
USPHS 11-20-76 S.R. Ranieri
NNS&DDCo. LTR 615C/H3280 6-23-77 R.L. Harrington
USCG 12-10-76 J.P. Witteveen

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

H.B. DWG NO. 5200-62
SHT. 1 OF. 1

SCALE 3/8" = 1 FT
DRAWN E.P. Costa
CHECKED J.C.
SECT MGR J. T. Coyote
TECH APPROVAL
DATE COMPL. 9-20-76
EXAMINED T.T. TAYLOR
AUTHORIZED A. CONLEY
DATE 4-25-77
C S D APPROVAL R.L. HARRINGTON

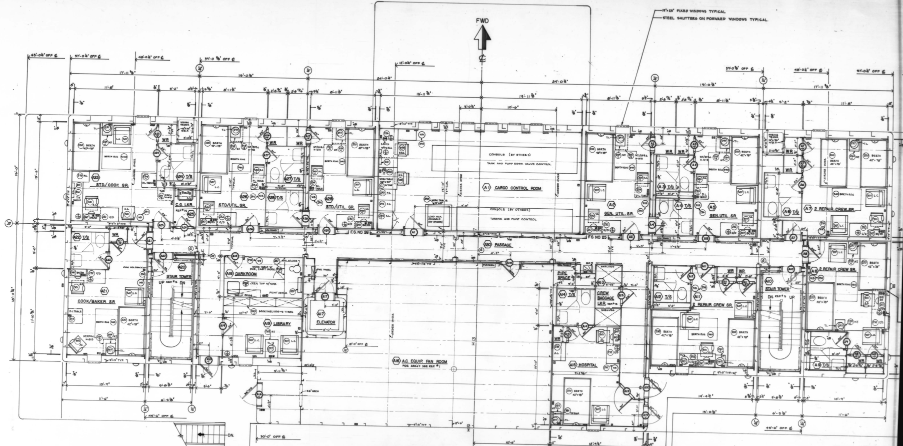
JOINER ARRANGEMENT
"A" DECK

U S M A DESIGN T11-S-116a
U S M A DWG NO.
HULL NO 613, 614, 615
DWG NO. 5200-62
REV D
SHEET NO. 1 OF 1

5200-62

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 1
10X

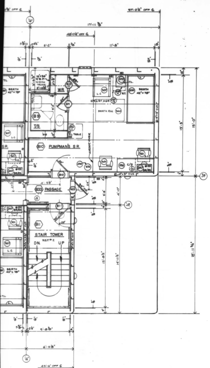

FWD
19"x25" FIXED WINDOWS TYPICAL
STEEL SHUTTERS ON FORWARD WINDOWS TYPICAL.
A23 STD/COOK SR.
A24 T/S
C.G. LKR.
STD/UTIL SR.
A27 T/S
A28 STD/UTIL SR.
A1 CARGO CONTROL ROOM
CONSOLE (BY OTHERS)
TANK AND PUMP ROOM VALVE CONTROL
CONSOLE (BY OTHERS)
TURBINE AND PUMP CONTROL
A2 GEN. UTIL. SR.
A3 T/S
A4 T/S
A5 GEN. UTIL. SR.
A6 T/S
A7 2 REPAIR CREW SR.
A22 T/S
A21 COOK/BAKER SR
A20 STAIR TOWER
A18 DARKROOM
A19 LIBRARY
A17 ELEVATOR
A30 PASSAGE
A16 A.C. EQUIP. FAN ROOM
PIPE SPACE
A14 T/S
A13 CREW BAGGAGE LKR.
A15 HOSPITAL
A12 T/S
A11 2 REPAIR CREW SR.
A10 STAIR TOWER
A8 2 REPAIR CREW SR.
A9 T/S
F.S. NO. 26
F.S. NO. 25
DN.
63'-0¼" OFF ℄
57'-0¼" OFF ℄
48'-0¼" OFF ℄
39'-0⅝" OFF ℄
12'-0⅜" OFF ℄
45'-0" OFF ℄
30'-0" OFF ℄
8
7
6
5
4
D
C
B
A

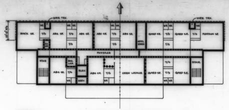
TRANSVERSE DECK BEAMS ARE 6"x3½"x9/16" ∠, FRAMES 9 & 11 TOE AFT.
LONGITUDINAL GIRDERS ARE 18"x4"x15.3# FLANGED PLATE.

"A" DECK

5200-62

SEPT. '80
FRAME 2
10X



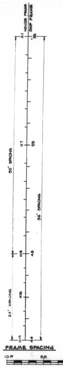


▬	"A-60" CLASS
▬	"A" CLASS
▬	"B" CLASS
●●●●	SOUNDSTOP
—	"C" CLASS
▨	DRAFTSTOP

BULKHEAD DESIGNATION PLAN

3/32"=1'-0"

NOTES:
1. ALL DECK AREA IS "A" CLASS UNLESS OTHERWISE NOTED.
2. ALL SHELL BULKHEADS, AND DECKS EXPOSED TO WEATHER, ARE WATERTIGHT CONSTRUCTION.



FRAME SPACING

ELECTRICAL SYMBOLS

☒	SWITCH, FLUSH MOUNTED IN DOOR JAMB OR BULKHEAD
■	SWITCH, SURFACE MOUNTED
▭	RECEPTACLE, SINGLE OR DUPLEX
●	RADIO AND TV OUTLET
◠	BERTH LIGHT/DESK LIGHT/EXTERIOR LIGHT
⊕⊕	AUTO DIAL PHONE, DESK/BULKHEAD MOUNTED
©	CLOCK, BULKHEAD MOUNTED
④	GENERAL ALARM BELL
▭	HANDY BOX
⊡	THERMOSTAT

LIST OF ABBREVIATIONS

BR/RS	BOOKRACK/RADIO SHELF
C/D	CHEST/DESK
C.T.	CORNER TABLE
D.F.	DRINKING FOUNTAIN
ET/CABT	END TABLE W. CABINET UNDER
F.C.	FILE CABINET
L.	BERTH LIGHT
L.C.	LOUNGE CHAIR
L.T.	COFFEE TABLE
N.T.	NIGHT TABLE
RFRG	REFRIGERATOR
RFRG/NT	REFRIGERATOR/NIGHT TABLE
S.B.	SIDEBOARD
S.C.	SIDE CHAIR
S.S.	SERVICE SINK
T.C./L	TOILET CABINET W. LIGHT
T/S	TOILET AND SHOWER SPACE
T.W.	TYPEWRITER
W.B.	WASTEBASKET
W.R.	WARDROBE
T.L.	TABLE LAMP
F.D.	FIRE DOOR
W.D.	WEATHERTIGHT DOOR
B.P.	BOLTED PLATE
A.P.	ACCESS PANEL
V.L.	VERTICAL LADDER
A.R.	ART REPRODUCTIONS

RESERVATIONS

REVISIONS

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHD	OWNER DATE	OWNER APPD
0		INITIAL ISSUE.	3-6-77	RLH	1-26-77 2-3-77	ZAPATA SHELL
A	6A	1. RELOCATED ACCESS TO SERVICE AREA B20 TO AVOID DUCTWORK.				
	—	2. REVISED FURNITURE SYMBOL NOS. TO AGREE WITH REF. # 10.				
	2D	3. ADDED DRAFTSTOP TO BULKHEAD DESIGNATION PLAN TO SUIT COAST GUARD REGULATIONS.				
	—	4. RELOCATED RECEPS. FOR STATEROOM REEFERS.				
	5B	5. ADDED SECOND SWITCH TO DOOR B16, & ADDED RECEP. TO STBD. BHD OF SPACE B16.				
	4B	6. DELETED MAGNETIC HOLDBACK FROM DOOR B11 TO SUIT VENTILATION REQUIREMENTS.				
	6B	7. DECREASED DRINKING FOUNTAIN NICHE DEPTH TO 1'5 1/2".				
	5,6B	8. ADDED ART REPRODUCTIONS TO CREW'S LOUNGE.				
	—	9. ADDED APPROVALS TO DWG. FOR REV. O				
B	6B	1. ADDED BULLETIN BOARD TO LOUNGE.				
	VAR.	2. ADDED READING LIGHT SWITCHES TO STATEROOMS & BHD MNTD LIGHT TO B23.				

AUTHORITY:

GENERAL NOTES:

1. ALL MATERIALS FOR BULKHEADS, LININGS, CEILINGS, AND INSULATION SHALL BE APPROVED INCOMBUSTIBLE IN ACCORD WITH EQUIPMENT LISTS C.G. #190.

NO.	REFERENCES	DWG NO.
14.	STOREROOMS AND LOCKERS	7700-554
13.	JOINER INSULATION	7000-110
12.	DECK COVERING ARR'GT. & DETAILS	5500-102
11.	WINDOW LIST	5400-53
10.	FURNITURE SCHEDULE	5300-549
9.	WARDROBE ARRANGEMENT & DETAILS	5250-67
8.	INTERIOR JOINER DOORS	5250-65
7.	EXTERIOR JOINER DOORS	5250-64
6.	WINDOW CASINGS	5200-78
5.	TYPICAL JOINER DETAILS	5200-75
4.	CEILING ARRANGEMENT - 'B' DK.	5200-70
3.	INTERIOR STORM RAILS ARR'GT. & DETAILS	5100-13
2.	JOINER STAIRS ARRANGEMENT & DETAILS	5100-12
1.	LIGHT SYSTEM ARRANGEMENT - 'B' DK.	4200-1368

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615	311	
614	310	
613	309	

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS

OWNERS ZAPATA LTR. 1-26-77 R.F. Brown
SHELL LTR. 14041, 2-3-77 A.K. Sumner
ABS NA
USPHS 11-26-76 S.R. Remus
NNSBDDCo LTR 613CH5200, 3-4-77 R.L. Harrington
USCG 12-10-76 J.D. Vittkauskas

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

H.B. DWG NO. 5200-63
SHT. 1 OF. 1

SCALE 3/8" = 1 FT
DRAWN E.Wyrick
CHECKED J.C.
SECT MGR J. T. Caputo
DATE COMPL. 9-20-76
EXAMINED T.T. Taylor
AUTHORIZED E.E. Stephenson
DATE 3-29-77
TECH APPROVAL
C S D APPROVAL R.L. HARRINGTON

JOINER ARRANGEMENT
"B" DECK

U S M A DESIGN T11-S-116a
U S M A DWG NO.
HULL NO. 613, 614, 615

DWG NO. 5200-63
REV B
SHEET NO. 1 OF 1

REPRODUCTION OFFICE

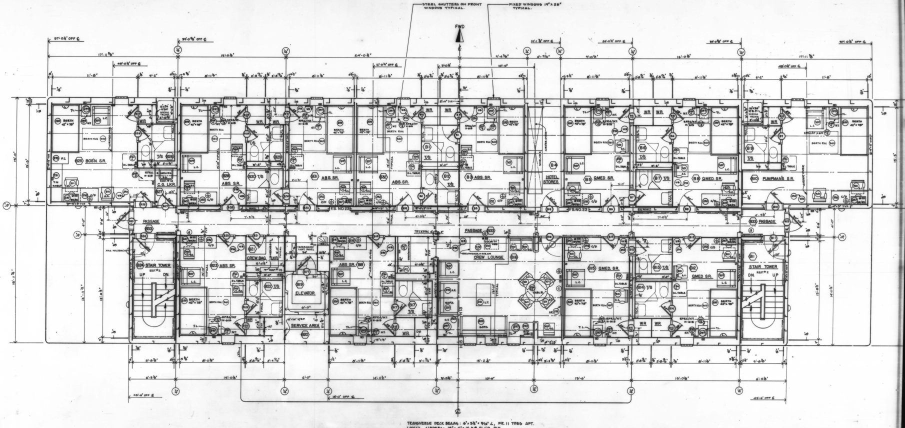
CHECKED BY DESIGN

GROUP:
MC NO.

5200-63

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 1
10X

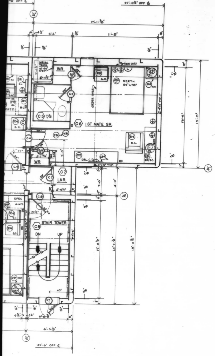

STEEL SHUTTERS ON FRONT WINDOWS TYPICAL.
FIXED WINDOWS 19" X 26" TYPICAL.
FWD
BOS'N S.R.
C.G. LKR.
ABS. SR.
HOTEL STORES
QMED SR.
PUMPMAN'S S.R.
F.S. NO. 23
F.S. NO. 22
PASSAGE
STAIR TOWER
UP
DN.
CREW BAG LKR
ELEVATOR
SERVICE AREA
CREW LOUNGE
SOFA
TABLE

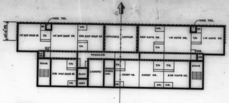
TRANSVERSE DECK BEAMS: 6"x3½"x 5/16" ∠, FR.11 TOES AFT.
LONG'L. GIRDERS: 18"x4"x15.3# FLG'D. PLT.

"B" DECK

5200-63

MICRO-MASTER 105 mm
K+E
SEPT. '80
FRAME 2
10X



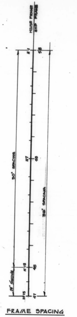


- ▬ A-60 CLASS
- ▬ A CLASS
- ▬ B CLASS
- — C CLASS
- ● ● ● ● SOUNDSTOP
- ▨ DRAFTSTOP

BULKHEAD DESIGNATION PLAN

3/32" = 1'-0"

NOTES:
1. ALL DECK AREA IS "A" CLASS UNLESS OTHERWISE NOTED.
2. ALL SHELL BULKHEADS ARE WATERTIGHT CONSTRUCTION.



FRAME SPACING

ELECTRICAL SYMBOLS

- ☒ SWITCH, FLUSH MOUNTED IN DOOR JAMB OR BULKHEAD.
- ■ SWITCH, SURFACE MOUNTED.
- ▣ RECEPTACLE, SINGLE OR DUPLEX
- ● RADIO AND TV OUTLET
- ◡ BERTH/DESK/MIRROR LIGHT
- ⊕⊕ AUTO DIAL PHONE, DESK/BULKHEAD MOUNTED
- ⊕ SOUND POWERED PHONE, DESK MOUNTED
- DESK TOP LIGHT
- Ⓒ CLOCK, BULKHEAD MOUNTED
- Ⓖ GENERAL ALARM BELL
- Ⓗ ELECTRIC HORN
- ⊞ HANDY BOX
- ▣ THERMOSTAT

LIST OF ABBREVIATIONS

A.R.	ART REPRODUCTIONS
A.C.	ARM CHAIR
B.C.	BOOKCASE
BR/RS.	BOOKRACK/ RADIO SHELF
C/D.	CHEST/DESK
C.T.	CORNER TABLE
DBL.C.D.	DOUBLE CHEST OF DRAWERS
D.F.	DRINKING FOUNTAIN
E.T./B.C.	END TABLE W. BOOKCASE UNDER
E.T./CABT.	END TABLE W. CABINET UNDER
F.C.	FILE CABINET
K.L.	KEY LOCKER
L.	BULKHEAD MOUNTED LIGHT
L.C.	LOUNGE CHAIR
L.T.	COFFEE TABLE
M.	MIRROR
N.T.	NIGHT TABLE
R.C.	RECLINING CHAIR
RFRG.	REFRIGERATOR
S.A.C.	SWIVEL ARM CHAIR
S.B.	SIDEBOARD
S.C.	SIDE CHAIR
S.P.F.T.D.	SINGLE PEDESTAL FLAT TOP DESK
S.S.	SERVICE SINK
T.C./L.	TOILET CABINET W. LIGHT
T/S.	TOILET AND SHOWER SPACE
W.B.	WASTEBASKET
W.R.	WARDROBE
T.L.	TABLE LAMP
F.D.	FIRE DOOR
W.D.	WEATHERTIGHT DOOR
B.P.	BOLTED PLATE
A.P.	ACCESS PANEL
V.L.	VERTICAL LADDER
I.S.	IRON SHELF

RESERVATIONS

REVISIONS

REV	ZONE	DESCRIPTION	N.N.S.&D.D.CO. DATE	N.N.S.&D.D.CO. AUTHO	OWNER DATE	OWNER APPD
0		INITIAL ISSUE.	3-4-77	R.L.H.	1-26-77 2-3-77	ZAPATA SHELL
A	6B	1. ADDED "FIRE DOOR" DESIGNATION TO DOOR C15.				
	4A	2. ADDED DOOR D9-1 TO STBD STAIR LANDING.				
	6A	3. RELOCATED ACCESS TO SERVICE AREA C18 TO AVOID DUCTWORK. ADDED SWITCH TO SUIT.				
	4B	4. DELETED MAGNETIC HOLDBACK AT DOOR C8 TO SUIT VENTILATION REQUIREMENTS.				
	—	5. REVISED FURNITURE SYMBOL NOS. TO AGREE WITH REF. # 10.				
	6B	6. DECREASED DEPTH OF DRINKING FOUNTAIN NICHE TO 15⅛".				
	2D	7. ADDED DRAFTSTOP TO BULKHEAD DESIGNATION PLAN TO SUIT COAST GUARD REQUIREMENTS.				
	6B	8. ADDED SECOND SWITCH AT DOOR C.1.				
		9. ADDED ART REPRODUCTIONS TO OFFICERS LOUNGE AND DAYROOMS.				
	6B	10. DELETED TELEPHONE PANEL PENDING NEW LOCATION.				
	—	11. ADDED APPROVALS FOR REV. 0.				
B	—	1. ADDED STORMRAILS TO AGREE W/ REF. # 3.				
	5C	2. ADDED BULLETIN BOARD TO LOUNGE.				
	VAR.	3. ADDED READING LIGHT SWITCHES TO TYP. STATEROOMS. ERG 10/12/77				
	4,7C	4. RELOCATED PHONES IN SR'S. C6 & C23 FOR HULL 615 ONLY TO SUIT ZAPATA REQUEST. ERG 11/4/77				
		5. REVISED SWING OF DOORS C6 & C23 TO HINGE OPP. HAND 2-9-78				

AUTHORITY:

GENERAL NOTES:

1. ALL MATERIALS FOR BULKHEADS, LININGS, CEILINGS AND INSULATION SHALL BE APPROVED INCOMBUSTIBLE IN ACCORD WITH EQUIPMENT LISTS C4#190

NNS & DD CO HULL NO.	MARAD HULL NO.
615	311
614	310
613	309

SHIPS NAME

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS

OWNERS ZAPATA LTR., 1-26-77 D.F. Brown SHELL LTR. MOSV, 2-3-77 G.K. Sumner	ABS NA.	USPHS 11-26-76 S.R. Romine
NNSBDDCo LTR. 613C/HS200, 3-4-77 R.L. Harrington	USCG 12-10-76 J.P. Whitaker	

NO.	REFERENCES	DWG NO.
15.	LAUNDRIES ARRANGEMENT AND DETAILS	7600-649
14.	STOREROOMS AND LOCKERS	7700-554
13.	JOINER INSULATION	7000-110
12.	DECK COVERING ARR'GT. & DETAILS	5500-102
11.	WINDOW LIST	5400-53
10.	FURNITURE SCHEDULE	5300-549
9.	WARDROBE ARRANGEMENT & DETAILS	5250-67
8.	INTERIOR JOINER DOORS	5250-65
7.	EXTERIOR JOINER DOORS	5250-64
6.	WINDOW CASINGS	5200-78
5.	TYPICAL JOINER DETAILS	5200-75
4.	CEILING ARRANGEMENT - "C" DECK	5200-71
3.	INTERIOR STORM RAILS ARR'GT. & DETS.	5100-13
2.	JOINER STAIRS ARR'GT. & DETAILS	5100-12
1.	LIGHTING SYSTEM ARR'GT. - 'C' DECK	4200-1369

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

H.B. DWG NO. 5200-64
SHT. 1 OF. 1

SCALE 3/8" = 1 FT
DRAWN E.P. Goode
CHECKED HCK
SECT MGR J. F. Caquto
DATE COMPL. 9-20-76
EXAMINED T.T. TAYLOR
AUTHORIZED E.E. STEPHENSON
DATE 3-29-77
TECH APPROVAL
CSD APPROVAL R.L. HARRINGTON

JOINER ARRANGEMENT
"C" DECK

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO. 613, 614, 615
DWG NO. 5200-64
REV B
SHEET NO. 1 OF 1

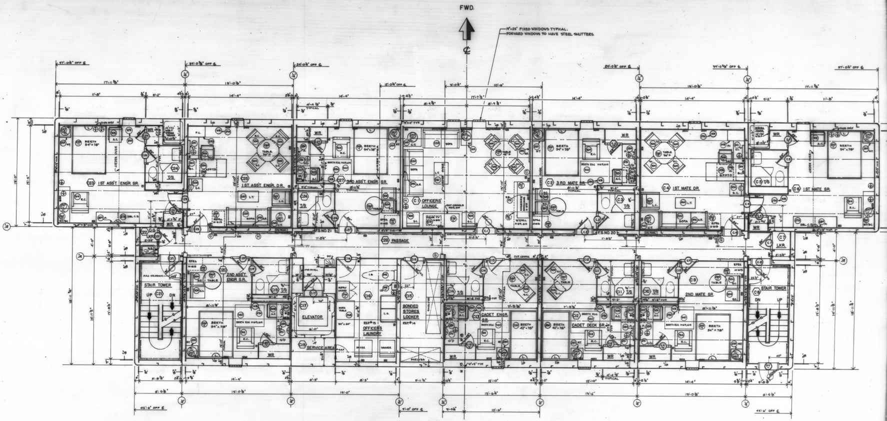
5200-64

MICRO-MASTER 105 mm

SEPT. '80

10X

FRAME 1


FWD.
℄
19"×25" FIXED WINDOWS TYPICAL.
FORWARD WINDOWS TO HAVE STEEL SHUTTERS.
1ST ASST. ENGR SR.
1ST ASST. ENGR. DR.
3RD ASST. ENGR SR.
OFFICERS' LOUNGE
3RD MATE SR.
1ST MATE DR.
1ST MATE SR.
BERTH 54"×78"
TABLE
SOFA
WR
T/S
F.S. NO. 21
F.S. NO. 20
PASSAGE
LKR
STAIR TOWER
UP
DN
2ND ASST. ENGR S.R.
ELEVATOR
SERVICE AREA
OFFICER'S LAUNDRY
BONDED STORES LOCKER
CADET ENGR SR.
CADET DECK SR.
2ND MATE SR.
BERTH 42"×78"
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C27
C28
45'-0" OFF ℄
57'-0⅛" OFF ℄
9'-0" OFF ℄
3'-0⅛"
10'-0"
13'-0⅛"
13'-6"
14'-4"
15'-0⅛"
17'-11⅝"

TRANSVERSE DECK BEAMS ARE 6"×3½"×9/16" ∠, FRAME 11 TO 85 AFT.
LONGITUDINAL GIRDERS ARE 18"×4"×15.3# FL'G'D. PLATE.

"C" DECK

5200-64

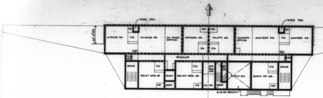
MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 2

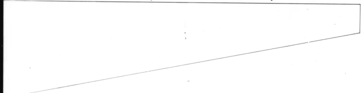


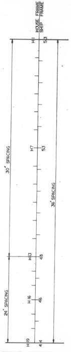
BULKHEAD DESIGNATION PLAN

3/32" = 1'-0"

▬	A-60 CLASS
▬	A CLASS
▪▪▪	B CLASS
▨	A-15 CLASS
—	C CLASS
● ● ● ●	SOUNDSTOP
▬	DRAFTSTOP

NOTES:
1. ALL DECK AREA IS "A" CLASS UNLESS OTHERWISE NOTED.
2. ALL SHELL BULKHEADS ARE WATERTIGHT CONSTRUCTION.





FRAME SPACING

LIST OF ABBREVIATIONS

B.C.	BOOKCASE
A.C.	ARM CHAIR
A.P.	ACCESS PANEL
A.S.	ADJUSTABLE STOOL
B.R.	BOOKRACK
BR/RS	BOOKRACK/RADIO SHELF
C/D	CHEST/DESK
C.T.	CORNER TABLE
DBL. C.D.	DOUBLE CHEST OF DRAWERS
D.F.	DRINKING FOUNTAIN
D.P.F.T.D.	DOUBLE PEDESTAL FLAT TOP DESK
E.M.	EXPANDED METAL
E.T.	END TABLE
F.C.	FILE CABINET
F.D.	FIRE DOOR
K.L.	KEY LOCKER
L.	LIGHT, BULKHEAD MOUNTED
L.C.	LOUNGE CHAIR
LKR.	LOCKER
L.T.	COFFEE TABLE
M.	MIRROR
N.T.	NIGHT TABLE
P.C.	PLAN CABINET
R.C.	RECLINING CHAIR
RFRG.	REFRIGERATOR
S.A.C.	SWIVEL ARM CHAIR
S.B.	SIDEBOARD
S.C.	SIDE CHAIR
S.P.F.T.D./T.W.	SINGLE PEDESTAL FLAT TOP DESK WITH TYPEWRITER ELL
S.S.	SERVICE SINK
TC/L.	TOILET CABINET WITH LIGHT
T.L.	TABLE LAMP
T/S	TOILET AND SHOWER SPACE
W.B.	WASTEBASKET
W.D.	WEATHERTIGHT DOOR
W.R.	WARDROBE
V.L.	VERTICAL LADDER
W.T.	WORK TABLE
A.R.	ART REPRODUCTIONS

RESERVATIONS

1. ARRANGEMENT OF CONTROL EQUIP. ROOM.

ELECTRICAL SYMBOLS

☒	SWITCH, FLUSH MOUNTED IN DOOR JAMB OR BULKHEAD
■	SWITCH, SURFACE MOUNTED
▭	RECEPTACLE, SINGLE OR DUPLEX
◕	RADIO AND TV OUTLET
◡	BERTH/DESK/MIRROR/EXTERIOR LIGHT
⊗	DESK TOP LIGHT
⊕ ⊕	AUTO DIAL PHONE, DESK/BULKHEAD MOUNTED
⊕	SOUND POWERED PHONE, DESK MOUNTED
Ⓖ	GENERAL ALARM BELL
Ⓒ	CLOCK, BULKHEAD MOUNTED
Ⓗ	ELECTRIC HORN
▭	HANDY BOX
Ⓑ	ALARM BELL
▣	THERMOSTAT

REVISIONS

REV	ZONE	DESCRIPTION	N N S & D D CO. DATE	N N S & D D CO. AUTHD	OWNER DATE	OWNER APPD
0		INITIAL ISSUE	3-4-77	R.L.H.	1-26-77 2-3-77	ZAPATA SHELL
A	6A/D 7A/D	1. RELOCATED LONG'L. GIRDERS 18'-0" OFF ℄ TO 18'-0¼" OFF ℄ P/S AND ADDED NOTE "TOES INBOARD" TO EACH.				
	7A	2. RELOCATED ACCESS TO SERVICE AREA D19 TO AVOID DUCTWORK. REVISED WARDROBE D21 AND ADDED SWITCH TO SUIT.				
	3-6B	3. DELETED MAGNETIC HOLDBACK FROM DOORS D9 & D14 TO SUIT VENTILATION REQ'MENTS.				
	—	4. REVISED FURNITURE SYMBOL NOS. TO AGREE WITH REF. #12.				
	6B	5. REVISED SWITCH AT DOOR D13 FROM SURFACE TO FLUSH MOUNTED.				
	7B	6. DECREASED DEPTH OF NICHE FOR DRINKG. FTN.				
	4D	7. ADDED DRAFTSTOP TO BULKHEAD DESIGNATION PLAN TO SUIT CONST GUARD REGULATIONS.				
	5BC	8. ADDED ART REPRODUCTIONS TO DR. 26 & 28.				
	6B	9. ADDED DOOR D12-1 7" AFT TO SUIT [illegible]				
	—	10. ADDED APPROVALS FOR REV. 0				
B	—	1. ADDED BULLETIN BOARDS TO OFFICES.				
	—	2. RELOCATED BOOKRACK/RADIO SHELVES FROM OFFICES TO DAYROOMS.				
	VAR.	3. ADDED READING LIGHT SWITCHES TO TYPICAL STATEROOMS. EPG 10/18/77.				
		4. REVISED SWING OF DOORS D6 & D14 TO HINGE OPP. HAND. [illegible]				
		5. ADDED STORAGE AREAS D1-1 & D28-1 AND ACCESS TO SAME FOR HULLS 613/614 ONLY PER NNCO # 129. EPG 3/2/78				

AUTHORITY:

GENERAL NOTES:

1. ALL MATERIALS FOR BULKHEADS, LININGS, CEILINGS, AND INSULATION SHALL BE APPROVED INCOMBUSTIBLE IN ACCORD WITH EQUIPMENT LISTS C.G. #190.

NO.	REFERENCES	DWG NO.
16.	STOREROOMS AND LOCKERS	7700-554
15.	JOINER INSULATION	7000-110
14.	DECK COVERING ARR'G'T. AND DETAILS	5500-102
13.	WINDOW LIST	5400-53
12.	FURNITURE SCHEDULE	5300-549
11.	WARDROBE ARRANGEMENT AND DETAILS	5250-67
10.	INTERIOR JOINER DOORS	5260-65
9.	EXTERIOR JOINER DOORS	5250-64
8.	WINDOW CASINGS	5200-78
7.	TYPICAL JOINER DETAILS	5200-76
6.	CEILING ARRANGEMENT, "D" DECK	5200-72
5.	INTERIOR STORM RAILS ARR'G'T. AND DETAILS	5100-13
4.	JOINER STAIRS ARR'G'T. AND DETAILS	5100-12
3.	LIGHTING SYSTEM ARR'G'T. - "D" DECK	4200-1370
2.	INCLINED LADDERS	3300-186
1.	RAILS AND STANCHIONS, FR. 44-58	3300-168
0.	DECK PLATING & BEAMS "D" DECK FR. 44-58	1270-580

NN S & DD CO. HULL NO.	MARAD HULL NO.	SHIPS NAME
615	311	
614	310	
613	309	

390,000 DWT. BULK OIL CARRIER
(ULCC)

APPROVALS
OWNERS ZAPATA LTR. 1-26-77 D.F. Brown
SHELL LTR. MOGV. 2-3-77 G.H. Sumner
NNS & DDCo. LTR. 6136/18200 3-4-77 R.L. Harrington
ABS N.A.
USPHS 11-26-76 S.R. Ramirez
USCG 12-10-76 J.D. Vitkauskas

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

H.B. DWG NO. 5200-65
SHT. 1 OF 1

SCALE 3/8" = 1 FT
DRAWN E.P. Goetz
CHECKED J.C.
SECT MGR J.T. Caputo
TECH APPROVAL
DATE COMPL. 9-20-76
EXAMINED T.T. TAYLOR
AUTHORIZED E.E. STEPHENSON
DATE 3-29-77
C S D APPROVAL R.L. HARRINGTON

JOINER ARRANGEMENT
"D" DECK

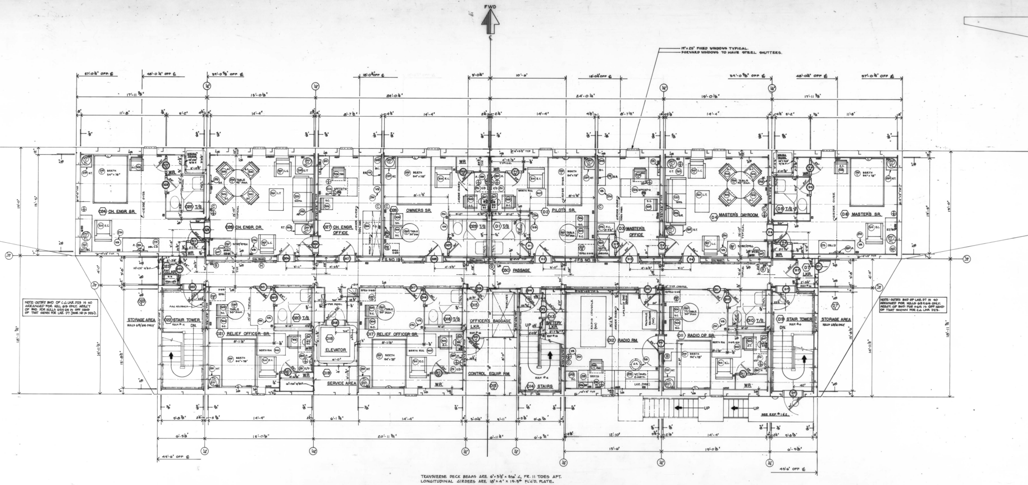
U S M A DESIGN T11-S-116a
U S M A DWG NO.
HULL NO.

DWG NO. 5200-65
REV B
SHEET NO. 1 OF 1

REPRODUCTION OFFICE

GROUP:

5200-65
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 1
10X


FWD
CH. ENGR SR.
T/S
WR
CH. ENGR DR.
CH. ENGR. OFFICE
OWNERS SR.
PILOTS SR.
MASTER'S OFFICE
MASTER'S DAYROOM
MASTER'S SR.
PASSAGE
S.NO 19
F.S. NO 18
STORAGE AREA
HULLS 615/616 ONLY
STAIR TOWER
DN.
C.G. LKR.
RELIEF OFFICER SR.
ELEVATOR
SERVICE AREA
OFFICER'S BAGGAGE LKR.
CONTROL EQUIP. RM.
BATTERY LKR.
STAIRS
UP
RADIO RM.
RADIO OP SR.
LKR.
SEE REF. 1 & 2.
57'-0 1/8" OFF ℄
48'-0 1/4" OFF ℄
39'-0 5/8" OFF ℄
18'-0" OFF ℄
45'-6" OFF ℄

19" x 25" FIXED WINDOWS TYPICAL.
FORWARD WINDOWS TO HAVE STEEL SHUTTERS.

NOTE: OUTB'D. BHD. OF C.G. LKR. D23 IS SO ARRANGED FOR HULL 615 ONLY. ARR'G'T OF BHD. FOR HULLS 613 & 614 IS OPP. HAND OF THAT SHOWN FOR LKR. D7 (DOOR NO 14 D23-1).

NOTE: OUTB'D. BHD OF LKR. D7 IS SO ARRANGED FOR HULLS 613 & 614 ONLY. ARR'G'T. OF BHD. FOR H-615 IS OPP. HAND OF THAT SHOWN FOR C.G. LKR. D23.

TRANSVERSE DECK BEAMS ARE 6" x 3 1/2" x 5/16" ∠, FR. 11 TOES AFT.
LONGITUDINAL GIRDERS ARE 18" x 4" x 15.3# FL'G'D. PLATE.

"D" DECK

LIST OF ABBREVIAT

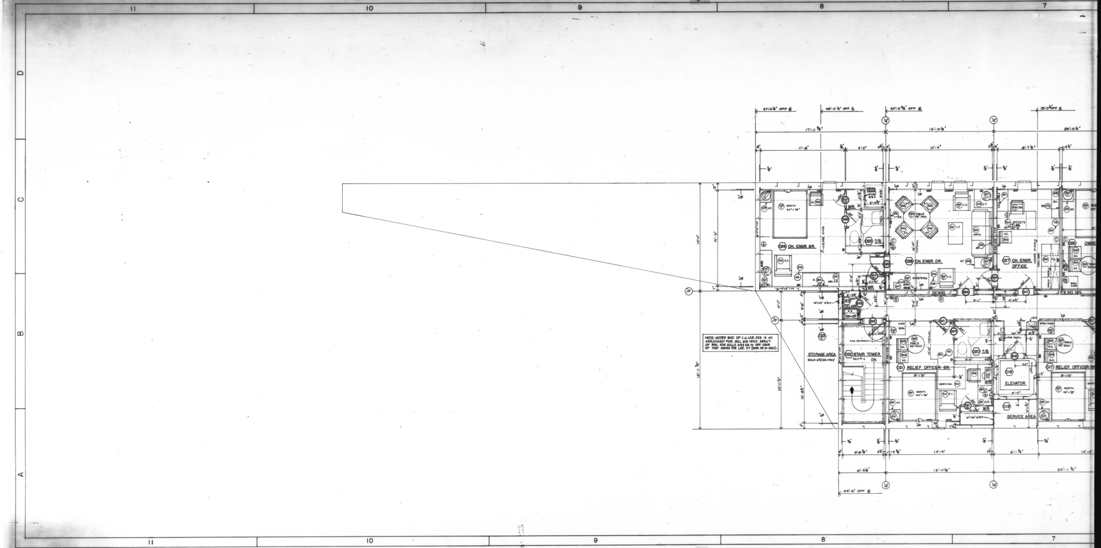
B.C. ______ BOOKCA
A.C. ______ ARM C
A.P. ______ ACCES
A.S. ______ ADJUST
B.R. ______ BOOKR
BR/RS ______ BOOKR
C/D ______ CHEST
C.T. ______ CORNE
DBL. C.D. ______ DOUBLE
D.F. ______ DRINKI
D.P.F.T.D. ______ DOUBLE
E.M. ______ EXPAN
E.T. ______ END TA
F.C. ______ FILE
F.D. ______ FIRE
K.L. ______ KEY L
L. ______ LIGHT,
L.C. ______ LOUNG
LKR. ______ LOCKE
L.T. ______ COFFE
M. ______ MIRRO
N.T. ______ NIGHT
P.C. ______ PLAN C
R.C. ______ RECLIN
RFRG. ______ REFRIG
S.A.C. ______ SWIVE
S.B. ______ SIDEBO
S.C. ______ SIDE C
S.P.F.T.D/TW ______ SINGLE WITH T
S.S. ______ SERVIC
TC/L. ______ TOILET
T.L. ______ TABLE
T/S ______ TOILET
W.B. ______ WASTE
W.D. ______ WEATH
W.R. ______ WARDR
V.L. ______ VERTICA
W.T. ______ WORK TA
A.R. ______ ART REP

RESERVATIONS
1. ARRANGEMENT OF CO

5200-65

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 2
10X


11
10
9
8
7
D
C
B
A
57'-0¼" OFF ℄
48'-0¼" OFF ℄
39'-0⅝" OFF ℄
18'-0¼" OFF ℄
17'-11⅜"
15'-0⅛"
24'-0¼"
11'-8"
5'-2"
14'-4"
8'-7½"
CH. ENGR SR.
BERTH 54" x 78"
WR.
T/S
TABLE 42" DIA.
LT.
SOFA
CH. ENGR. DR.
CH. ENGR. OFFICE
OWNER
F.S. NO 191
C.G. LKR
STORAGE AREA
HULLS 613/614 ONLY
STAIR TOWER
DN.
RELIEF OFFICER SR.
TABLE 30" DIA.
ELEVATOR
SERVICE AREA
RELIEF OFFICER SR.
NOTE: OUTB'D BHD. OF C.G. LKR. D23 IS AS ARRANGED FOR HULL 615 ONLY. ARR'G'T OF BHD. FOR HULLS 613 & 614 IS OPP HAND OF THAT SHOWN FOR LKR. D7 (DOOR NO IS D23-1).
15'-0"
15'-5"
18'-11¾"
14'-11½"
6'-5⅛"
15'-0⅛"
20'-11¾"
45'-6" OFF ℄

5200-65

MICRO-MASTER® 105 mm

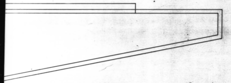
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

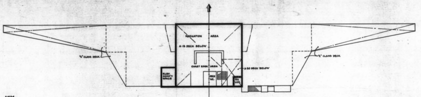
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME 3

10X





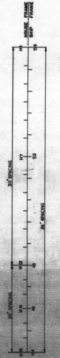
A-CLASS ▬
B-CLASS ▣
C-CLASS —

BULKHEAD DESIGNATION PLAN

3/32" = 1'-0"

NOTES:

1. ALL DECK AREA IS "A" CLASS, UNLESS OTHERWISE NOTED.
2. ALL SHELL BULKHEADS AND DECKS EXPOSED TO WEATHER ARE WATERTIGHT CONSTRUCTION.



FRAME SPACING

REVISIONS						
REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH'D	OWNER DATE	OWNER APP'D
0		INITIAL ISSUE	3-4-77	R.H.	2-3-77	SHELL
A	8B 7,8C 7,8C —	1. REVISED SOFA BERTH TO AGREE WITH REF #11. 2. RELOCATED L.P. RACKS FOR CONVENIENCE. 3. RELOCATED P/S ACCESSES TO CATWALK. 4. ADDED APPROVALS TO REV O				

AUTHORITY:

GENERAL NOTES:

1. ALL MATERIALS FOR BULKHEADS, LININGS, CEILINGS, AND INSULATION SHALL BE APPROVED INCOMBUSTIBLE IN ACCORD WITH EQUIPMENT LISTS C.G. #190.

NO.	REFERENCES	DWG NO.
16	STOREROOMS AND LOCKERS	7700-554
15	JOINER INSULATION	7000-110
14	DECK COVERING, ARR'G'T AND DETAILS	5500-102
13	WINDOW LIST	5400-53
12	WINDOWS AND WIPERS IN WHEELHOUSE	5400-52
11	FURNITURE SCHEDULE	5300-549
10	INTERIOR JOINER DOORS	5250-65
9	EXTERIOR JOINER DOORS	5250-64
8	WHEELHOUSE WINDOW CASINGS	5200-77
7	TYPICAL JOINER DETAILS	5200-75
6	CEILING ARRANGEMENT, NAV. BRIDGE DECK	5200-74
5	INTERIOR STORMRAILS, ARR'G'T AND DETAILS	5100-13
4	JOINER STAIRS, ARR'G'T AND DETAILS	5100-12
3	CATWALK ARR'G'T AND DETAILS	3300-608
2	INCLINED LADDERS	3300-186
1	RAILS AND STANCHIONS FR. 44-58	3300-168

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614 613	310 309	390,000 DWT. BULK OIL CARRIER (U.L.C.C.)

APPROVALS

OWNERS: SHELL LTR 1407V, 2-3-77 G.K. Sumner
ABS: N.A.
USPHS: 11-26-76 S.R. Runion
NNSDDCo.: LTR 6131/H5200, 3-4-77, R.L. Harrington
USCG: 12-10-76 J.D. Vilkauskas

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

H.B. DWG NO.
SHT. OF.

SCALE 3/8" = 1 FT
DRAWN E.P.
CHECKED E.G.
SECT MGR J. F. Cozzuto
TECH APPROVAL
DATE COMPL. 11/2/76
EXAMINED
AUTHORIZED A. Cowling
DATE 4-25-77
C.S.D. APPROVAL R. L. Harrington

JOINER ARRANGEMENT

NAV. BRIDGE DECK

U.S.M.A DESIGN T11-S-116a
U.S.M.A DWG NO.
HULL NO. 613, 614

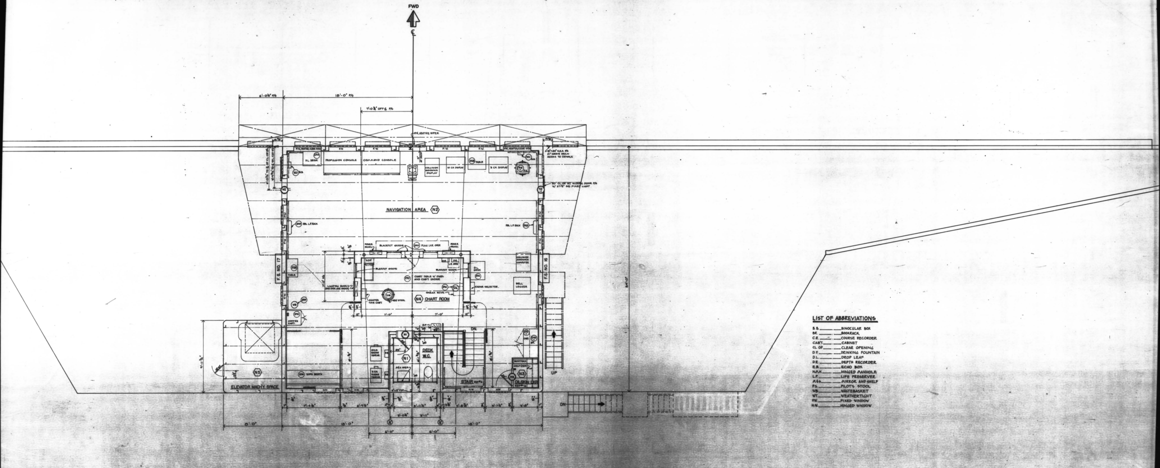
DWG NO. 5200-67
REV A
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS NEW DRAWING FOR ISSUE
DATE 5/6/77 SIGNED

GROUP: NC NO.

5200-67 REV. A

SEPT. '80
FRAME 1
10X


FWD
℄
6'-0¼" P/S
18'-0" P/S
7'-0¾" OFF ℄ P/S
P.W., HEATED, WIPER
P.W., HEATED, CLEAR VIEW
P.W.
D.L. DESK
PROPULSION CONSOLE
COMMAND CONSOLE
COLLISION AVOIDANCE DISPLAY
10 C.R. DISPLAY
TABLE
3 C.R. DISPLAY
P.S.
B.B.
18" x 24" H.A.H. P/S 21" ABOVE DECK ACCESS TO CATWALK
30" CL. OP. WT. SLIDING DOOR P/S W/ 27½" SQ. FIXED LIGHT
N2
NAVIGATION AREA
DBL. L.P. RACK
POWER PANEL
BLACKOUT SHADE
FLAG LKR. OVER
F.S. NO. 17
F.S. NO. 16
ADF
D.R.
E.B.
L.E. OVER
D.L. DESK
COLLISION AVOIDANCE COMPUTER
CHART TABLE W/ DWRS. AND CAB'T UNDER
LIGHTING PANELS (ONE OVER, ONE UNDER)
MASTER TIME CAB'T.
ADJ. STOOL
OMEGA RCVR.
RADAR SELECTOR
BELL LOGGER
N4
CHART ROOM
W.B.
COFFEE CAB'T.
7'-0"
12"
D.F.
N1
DECK W.C.
10 C.R. RADAR TRCVR.
3 C.R. RADAR TRCVR.
M & S OVER
DN.
UP
STAIR
CAB.
BOOTRACK
SHELF OVER
N3
OILSKIN LKR.
N5
SOFA BERTH
ELEVATOR MACH'Y. SPACE
H.W.
9'-11¾"
34'-0"
7'-4⅛"
6'-9½"
3'-0¼"
3'-11"
5'-11¼"
5'-8⅞"
3'-7¼"
3'-6"
8'-0"
18'-0"
6'-0"
DN
9
8
7
6
5

LIST OF ABBREVIATIONS

B.B.	BINOCULAR BOX
BR.	BOOKRACK
C.R.	COURSE RECORDER
CAB'T.	CABINET
CL. OP.	CLEAR OPENING
D.F.	DRINKING FOUNTAIN
D.L.	DROP LEAF
D.R.	DEPTH RECORDER
E.B.	ECHO BOX
H.A.H.	HINGED MANHOLE
L.P.	LIFE PRESERVER
M&S	MIRROR AND SHELF
P.S.	PILOT'S STOOL
W.B.	WASTEBASKET
W.T.	WEATHERTIGHT
F.W.	FIXED WINDOW
H.W.	HINGED WINDOW

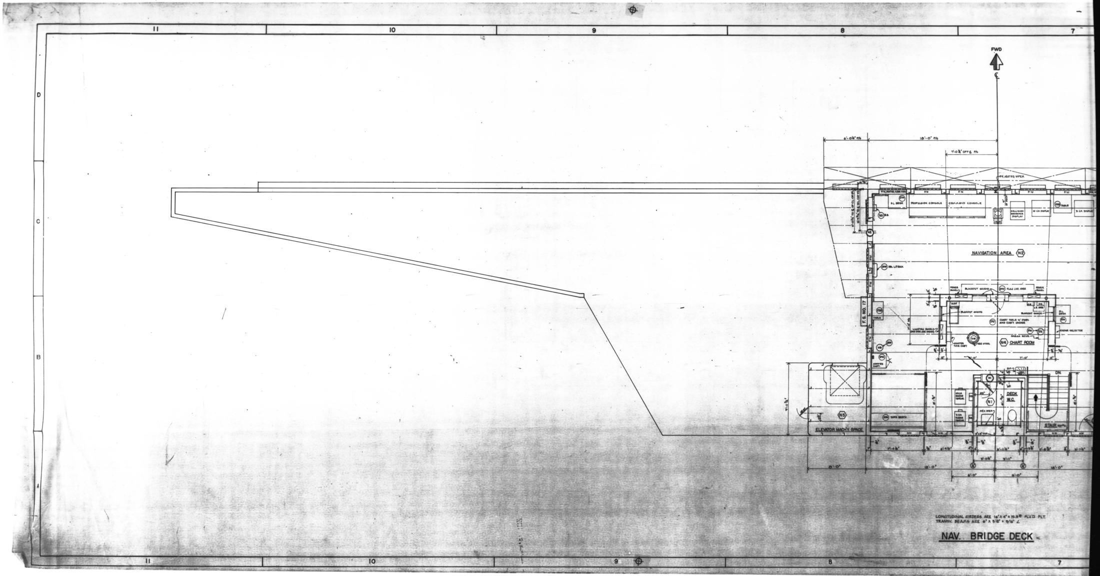
LONGITUDINAL GIRDERS ARE 16" X 4" X 15.3# FL'G'D. PLT.
TRANSV. BEAMS ARE 6" X 3½" X 5/16" ∠

NAV. BRIDGE DECK

5200-67 REV. A

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 2
10X


11
10
9
8
7
D
C
B
A
FWD
℄
6'-0¼" F/S
18'-0" F/S
7'-0¾" OFF ℄ F/S
P.W. HEATED WIPER
P.W. HEATED, CLEAR VIEW
P.W.
D.L. DESK
PROPULSION CONSOLE
COMMAND CONSOLE
COLLISION AVOIDANCE DISPLAY
10 CR. DISPLAY
TABLE
3 CR. DISPLAY
N2
NAVIGATION AREA
N2
DBL. L.P. RACK
F.S. NO. 17
TABLE
POWER PANEL
BLACKOUT SHADE
FLAG LKR. OVER
ADF
CHART TABLE W/ DWRS. AND CAB'T. UNDER
D.L. DESK
RADAR SELECTOR
LIGHTING PANELS (ONE OVER, ONE UNDER)
MASTER TIME CAB'T.
ADJ STOOL
N4
CHART ROOM
COFFEE CAB'T.
7'-0"
12"
N5
ELEVATOR MACH'Y. SPACE
SOFA BERTH
10 CR. RADAR TRANSV.
3 CR. RADAR TRANSV.
N1
DECK W.C.
STAIR
DN.
8'-0"
18'-0"
6'-0"
6'-0"
18'-0"
3'-0¼"
3'-11"
7'-4½"
6'-9½"
5'-11¼"
5'-8⅞"
3'-7½"
9'-11¾"
6'-1¾"

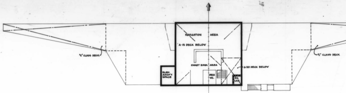
LONGITUDINAL GIRDERS ARE 16" X 4" X 15.3# FL'G'D. PLT.
TRANSV. BEAMS ARE 6" X 3½" X 5/16" ∠

NAV. BRIDGE DECK

5200-67 REV. A

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 3
10X



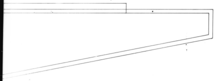
▬ A-CLASS
▪▪▪ B-CLASS
— C-CLASS

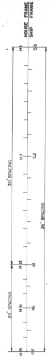
BULKHEAD DESIGNATION PLAN

3/32" = 1'-0"

NOTES:

1. ALL DECK AREA IS "A" CLASS, UNLESS OTHERWISE NOTED.
2. ALL SHELL BULKHEADS AND DECKS EXPOSED TO WEATHER ARE WATERTIGHT CONSTRUCTION.





FRAME SPACING

REVISIONS						
REV	ZONE	DESCRIPTION	NNS&DDCO DATE	NNS&DDCO AUTHD	OWNER DATE	OWNER APPD
0		INITIAL ISSUE	3-4-77	R.L.H.	2-3-77	SHELL
A	8B 7BC 7BC —	1. REVISED SOFA BERTH TO AGREE WITH REF #11. 2. RELOCATED L.P. RACKS FOR CONVENIENCE. 3. RELOCATED P/S ACCESSES TO CATWALK. 4. ADDED APPROVALS TO REV O				
B	7-A 2,3D	1. ADDED STORM RAIL TO AGREE W/REF #5. 2. REVISED DECK AREA OVER TRIANGULAR VOIDS TO "A" CLASS TO SUIT USE OF VOIDS AS STORAGE SPACES				

AUTHORITY:

GENERAL NOTES:

1. ALL MATERIALS FOR BULKHEADS, LININGS, CEILINGS, AND INSULATION SHALL BE APPROVED INCOMBUSTIBLE IN ACCORD WITH EQUIPMENT LISTS C.G. #190.

NO.	REFERENCES	DWG NO.
16	STOREROOMS AND LOCKERS	7700-554
15	JOINER INSULATION	7000-110
14	DECK COVERING, ARR'G'T AND DETAILS	5500-102
13	WINDOW LIST	5400-53
12	WINDOWS AND WIPERS IN WHEELHOUSE	5400-52
11	FURNITURE SCHEDULE	5300-549
10	INTERIOR JOINER DOORS	5260-65
9	EXTERIOR JOINER DOORS	5260-64
8	WHEELHOUSE WINDOW CASINGS	5200-77
7	TYPICAL JOINER DETAILS	5200-75
6	CEILING ARRANGEMENT, NAV. BRIDGE DECK	5200-74
5	INTERIOR STORMRAILS, ARR'G'T. AND DETAILS	5100-13
4	JOINER STAIRS, ARR'G'T. AND DETAILS	5100-12
3	CATWALK ARR'G'T. AND DETAILS	3300-608
2	INCLINED LADDERS	3300-186
1	RAILS AND STANCHIONS FR. 44-58	3300-168

NNS & DD CO HULL NO.	MARAD HULL NO.
614	310
613	309

SHIPS NAME

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS

OWNERS: SHELL LTR 1407V, 2-3-77 G.K. Sumner
NNSDDCo. LTR 613/H5200, 3-4-77, R.L. Harrington
ABS: NA
USPHS: 11-26-76 S.R. Ruminu
USCG: 12-10-76 J.D. Villeauker

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV
FSCM NO 43689
DEPT

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

H.B. DWG NO.
SHT. OF.

SCALE 3/8" = 1 FT
DRAWN E.P. Gosetto
CHECKED G.G.
SECT MGR J. L. Caputo
DATE COMPL. 11/2/76
EXAMINED T.T. TAYLOR
AUTHORIZED A. CONLEY
DATE 4-25-77
TECH APPROVAL
C.S.D. APPROVAL R.L. HARRINGTON

JOINER ARRANGEMENT

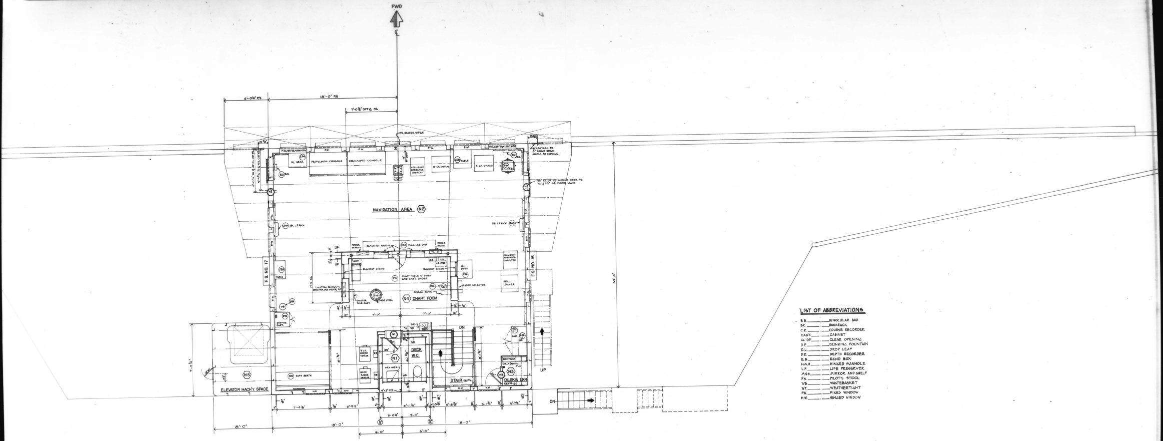
NAV. BRIDGE DECK

U.S.M.A. DESIGN T11-S-116a.
U.S.M.A. DWG NO.
HULL NO. 613, 614

DWG NO. 5200-67
REV. B
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS
GROUPING
REMARKS
DATE
SIGNED
DEPT.
YARD PRINTS
ORDERED BY DESIGN
GROUP
MC NO.

5200-67 REV. B
MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 1
10X


FWD
℄
6'-0⅛" F/S
18'-0" F/S
7'-0⅜" OFF ℄ F/S
F.W. HEATED WIPER
F.W. HEATED, CLEAR VIEW
F.W.
D.L. DESK
PROPULSION CONSOLE
COMMAND CONSOLE
COLLISION AVOIDANCE DISPLAY
10 C.R. DISPLAY
TABLE
3 C.R. DISPLAY
P.S.
B.B.
18" × 24" H.M.H. F/S 21" ABOVE DECK ACCESS TO CATWALK
30" CL. OP. OF W.T. SLIDING DOOR F/S W/ 8"×12" SQ. FIXED LIGHT
NAVIGATION AREA
N2
DBL. L.P. RACK
F.S. NO. 17
F.S. NO. 16
POWER PANEL
BLACKOUT SHADE
FLAG LKR. OVER
C.R.
D.R.
L.R. OVER
ADF
D.L. DESK
CHART TABLE W/ DWRS AND CAB'T. UNDER
COLLISION AVOIDANCE COMPUTER
BELL LOGGER
LIGHTING PANELS (ONE OVER, ONE UNDER)
RADAR SELECTOR
OMEGA RCVR.
MASTER TIME CAB'T.
ADJ. STOOL
N4
CHART ROOM
WB
COFFEE CAB'T.
3 C.R. RADAR TRANSCVR.
10 C.R. RADAR TRANSCVR.
E.B.
D.F.
N1
DECK W.C.
M & S OVER
DN.
STAIR
CAB'T.
BR.
BOOKRACK
SHELF
N3
OILSKIN LKR
UP
DN
N5
SOFA BERTH
ELEVATOR MACH'Y. SPACE
H.W.
7'-0"
7'-0"
8'-0"
18'-0"
18'-0"
6'-0"
6'-0"
3'-0¼"
3'-11"
7'-4⅝"
6'-9½"
5'-11¼"
5'-8⅞"
3'-7¾"
3'-7½"
9'-11⅞"
34'-0"

LIST OF ABBREVIATIONS

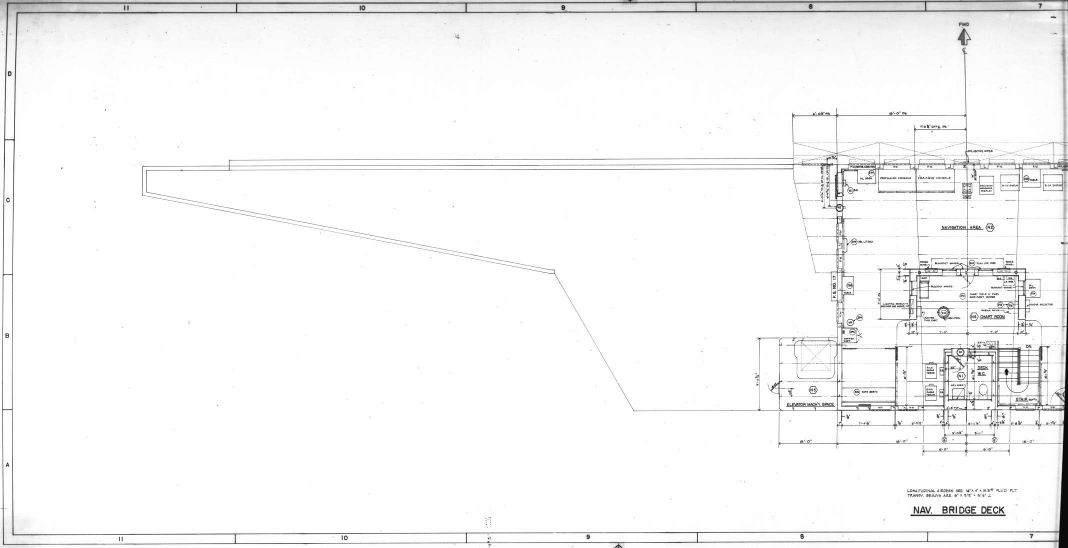
B.B.	BINOCULAR BOX
BR.	BOOKRACK
C.R.	COURSE RECORDER
CAB'T.	CABINET
CL. OP.	CLEAR OPENING
D.F.	DRINKING FOUNTAIN
D.L.	DROP LEAF
D.R.	DEPTH RECORDER
E.B.	ECHO BOX
H.M.H.	HINGED MANHOLE
L.P.	LIFE PRESERVER
M&S	MIRROR AND SHELF
P.S.	PILOT'S STOOL
WB	WASTEBASKET
WT.	WEATHERTIGHT
F.W.	FIXED WINDOW
H.W.	HINGED WINDOW

LONGITUDINAL GIRDERS ARE 16" X 4" × 15.3# FL'G'D. PLT.
TRANSV. BEAMS ARE 6" X 3½" × 5/16" ∠

NAV. BRIDGE DECK

5200-67 REV. B.

SEPT. '80
FRAME 2
10X

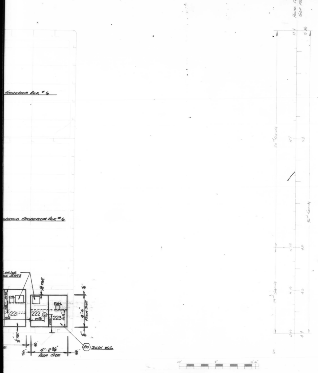

11
10
9
8
7
D
C
B
A
FWD
℄
6'-0¼" F/S
18'-0" F/S
7'-0⅜" OFF ℄ F/S
F/V, HEATED WIPER
F/V, HEATED, CLEAR VIEW
F.V.
P.V.
D.L. DESK
PROPULSION CONSOLE
COMMAND CONSOLE
COLLISION AVOIDANCE DISPLAY
10 C.R. DISPLAY
TABLE
B C.R. DISPLAY
B.B.
N2
NAVIGATION AREA
DBL. L.P. RACK
F.S. NO. 17
TABLE
POWER PANEL
BLACKOUT SHADE
FLAG LKR. OVER
ADF
BLACKOUT SHADE
D.L. DESK
L.K. OVER
CHART TABLE W/ DWRS. AND CAB'T. UNDER
LIGHTING PANELS (ONE OVER, ONE UNDER)
MASTER TIME CAB'T
STOOL
N4
CHART ROOM
RADAR SELECTOR
7'-0" F/S
12"
7'-0"
7'-0"
12"
COFFEE CAB'T.
DN.
N1
DECK W.C.
9 C.R. RADAR TRCVR.
10 C.R. RADAR TRCVR.
STAIR
N5
ELEVATOR MACH'Y. SPACE
SOFA BERTH
9'-11⅜"
6'-1⅜"
7'-4⅝"
6'-9½"
3'-11¼"
5'-8⅝"
3'-7⅜"
3'-0⅛"
3'-11"
8'-0"
18'-0"
18'-0"
6'-0"
6'-0"
11
10
9
8
7

LONGITUDINAL GIRDERS ARE 16" X 4" × 15.3# FL'G'D. PLT.
TRANSV. BEAMS ARE 6" X 3½" × 5/16" ∠

NAV. BRIDGE DECK

5200-67 REV. G.

SEPT. '80
FRAME 3
10X



REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHD	OWNER DATE	OWNER APPD
0		SUBMITTED FOR APPROVAL	4-20-77	RLH	3-25-77	GKS
A		INITIAL ISSUE				
B	ALL	CEILING PANELS NUMBERS UPDATED TO AGREE WITH DETAILS. CREW & OFFICERS MESS REV. FOR 48×48 PNLS. AND DIM. FOR JOB FAB, AND FURRING AND LIGHTS LOCATED IN ROOMS WITHOUT TROUGHS.				
C	3,6	1) PANELS 67, 68, 69, & 70 LIGHTS, DIFFUSERS AND EXH. 8" RELOCATED AND 2 PANELS 203 EXH. ADDED TO SUIT REF. #8.				
		2) REARRANGED STBD FWD. PASSAGE TO SUIT DESIGN DEVELOPMENTS-EG				
	4	3) REVISED LIGHT LOCATION IN PANEL 214. EG 10/27/77				
	4	4) MOVED LIGHT 8" AFT IN P# 217, STBD. AFT PASSAGE TO AVOID INTERFERENCE W/ HIS GIRDER. EG 10/22/77				
	6,5	5) REV. LOCATIONS OF VENT. CUTS IN PANELS 68, 69, 205				
	7B	6) SWITCHED LOC. OF ACCESS PNL #98 FROM OUTBD TO INBD. SIDE OF DIFF. TERM. & PNLS. 61 & 97 TO SUIT				

AUTHORITY:

GENERAL NOTES:

1. CEILING PANELS SHALL BE .08 ALUM. 'V' JOINTED CONSTRUCTION WITH A BAKED ENAMEL FINISH.
2. CEILING SHALL BE SUPPORTED IN ACCORDANCE WITH TYP. JOINER DETAILS REF. #3.
3. ALL CEILING HEIGHTS ARE 7'-0".

NO.	REFERENCES	DWG NO.
8	VENTILATION ARRANGEMENT CAMBER DECK.	2680-599
7	OVERHEAD ASSEMBLIES (ROOMS WITH TROUGHS)	HB-875
6	REFRIGERATED STOREROOM ARRANGEMENT & DETAILS	5450-141
5	GALLEY SHEATHING ARRANGEMENT & DETAILS	7900-383
4	JOINER STAIRS	5100-12
3	TYPICAL JOINER DETAILS	5200-75
2	LIGHTING SYSTEMS ARRANGEMENT CAMBER DK.	4800 1871
1	JOINER ARRANGEMENT CAMBER DK. 613, 614	5200-61

NN S & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614 613	310 309	390,000 DWT. BULK OIL CARRIER (U.L.C.C.)

APPROVALS

OWNERS SHELL LTR 1564V DTD 3-25-77 G.K. SUMNER	ABS N.A.	USPHS 1-7-77 S.R. Rumma
NEWPORT NEWS LTR 613C/H5200 DTD 4-20-77 R.L. HARRINGTON	USCG	1-6-77 J.D. Vitkauskas

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.
H.B. DWG NO. 5200 68
SHT. 1 OF. 1

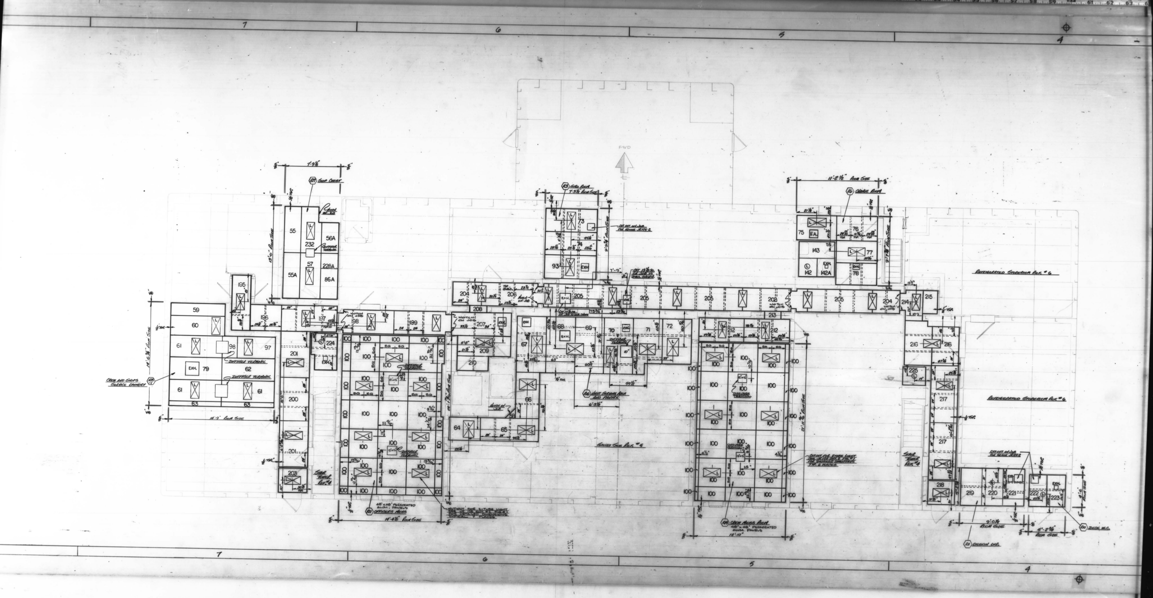
SCALE 3/16" = 1'-0" = 1 FT
DRAWN [illegible]
CHECKED K
SECT MGR J.T. Cognito
TECH APPROVAL
DATE COMPL. 12-21-76
EXAMINED T.T. TAYLOR
AUTHORIZED A. CONLEY
DATE 5-13-77
C S D APPROVAL R.L. HARRINGTON

CEILING ARRANGEMENT
CAMBER DECK

U S M A DESIGN 711-S-1162
U S M A DWG NO.
HULL NO. 613, 614
DWG NO. 5200-68
REV C
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
GROUP:
MC NO.

5200-68
MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 1


7
6
5
4
FWD
SLOP CHEST
7'-9 1/8"
13'-0" ROOM SIZE
NOTCH ON JOB
DIFFUSER TERMINAL
CREW AND SHIPS SERVICE LAUNDRY
14'-6 3/4" ROOM SIZE
14'-9" ROOM SIZE
DIFFUSER TERMINAL
EXH.
STAIR TOWER REF. #4
48"x48" PERFORATED ALUM. PANELS
OFFICERS MESS
14'-4 1/8" ROOM SIZE
CUTOUT FOR 2-TUBE LIGHT SEE J6 116 SHT 22 FIG. 21 FOR DETAILED DIMENSIONS TYPICAL 7 PLACES
NOTCH ON JOB
GYRO ROOM
7'-3 1/2" ROOM SIZE
CUT OUT ON JOB FOR GENIE JE105-2
CHANGE ROOM
11'-2 1/2" ROOM SIZE
NIGHT SERVING AREA AND PANTRY
6'-3 1/2"
GALLEY SEE REF. #5
CREW MESS ROOM
48"x48" PERFORATED ALUM. PANELS
12'-10"
21'-11 3/8" ROOM SIZE
CUT-OUT FOR STAGE LIGHT SEE JE166 SHT 6 FIG. 1 FOR DETAILED DIMENSIONS TYP. 6 PLACES
REFRIGERATED STOREROOM REF. #6
REFRIGERATED STOREROOM REF. #6
STAIR TOWER REF. #4
CUT-OUT ON JOB FOR GENIE JE105-2
9'-0 1/8" ROOM SIZE
4'-2 3/4" ROOM SIZE
4'-6" ROOM SIZE
DECK W.C.
OILSKIN LKR.
55
56A
232
57
55A
228A
86A
195
59
60
61
98
97
79
62
61
61
63
63
196
197
198
199
224
201
200
201
203
100
204
206
208
207
209
210
67
68
69
70
71
72
66
64
65
73
74
93
205
205
205
202
205
204
213
212
212
75
76
77
143
142
142A
78
214
215
216
216
225
217
217
218
219
220
221
222
223

5200 - 68

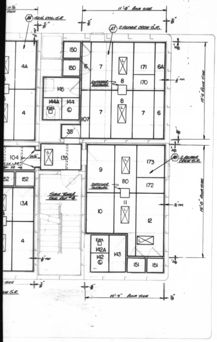
MICRO-MASTER 105 mm

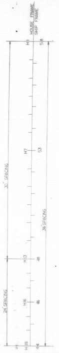
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 2

10X


11'-8" ROOM SIZE
A6 GEN. UTIL. S.R.
A7 2 REPAIR CREW S.R.
A8 2 REPAIR CREW S.R.
4A
4
150
150
145
144A
144
EXH.
6
7
8
171
170
6A
107
35
104
135
152
9
80
173
172
DIFFUSER TERMINAL
11
10
12
13A
STAIR TOWER SEE REF #4
142A
142
143
151
151
13'-6" ROOM SIZE
15'-8" ROOM SIZE
10'-9" ROOM SIZE
L


HOUSE FRAME
SHIP FRAME
H1
58
H7
53
H3
48
H6
46
H9
44
30" SPACING
36" SPACING
24" SPACING

FRAME SPACING

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHD	OWNER DATE	OWNER APPD
0		SUBMITTED FOR APPROVAL INITIAL ISSUE	1-4-77	RLH	2-3-77 2-10-77	SHELL ZAPATA
A		CARGO CONTROL ROOM (A1) CEILING REARRANGED TO SUIT REF #2 & CEILING PANEL NUMBER UPDATED TO AGREE WITH DETAILS. FURRING AND LIGHT LOCATIONS ADDED TO ROOMS WITHOUT TROVANS				
B	4B	PANEL #234 WAS #232				

AUTHORITY:

GENERAL NOTES:

1. CEILING PANELS SHALL BE .08 ALUM. 'V' JOINTED CONSTRUCTION WITH A BAKED ENAMEL FINISH.
2. CEILING SHALL BE SUPPORTED IN ACCORDANCE WITH TYP. JOINER DETAILS REF. #3.
3. ALL CEILING HEIGHTS ARE 7'-0".
4. REFER TO REF #5 FOR TYP. CREW S.R. OVERHEAD ASSEMBLY DETAIL.

NO.	REFERENCES	DWG NO.
6	OVERHEAD ASSEMBLIES (ROOMS WITH TROVANS)	HB-875
5	CEILING ARRANGEMENT 'B' DECK	5200-70
4	JOINER STAIRS	5100-12
3	TYPICAL JOINER DETAILS	5200-75
2	LIGHTING SYSTEMS ARRANGEMENT 'A' DECK	4200-1367
1	JOINER ARRANGEMENT 'A' DECK	5800-62

NNS & DD CO HULL NO.	MARAD HULL NO.
615	311
614	310
613	309

SHIPS NAME

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS

OWNERS SHELL LTR 1400V 2-3-77 GK Sumner ZAPATA LTR 2-10-77 DF Brown
ABS N.A.
USPHS 12-20-76 S.R. Ramirez
NEWPORT NEWS LTR 613C/H5200 3-14-77 RL Harrington
USCG 1-5-77 J.D. Vittauskas

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

H.B. DWG NO. 5200-69
SHT. 1 OF. 1

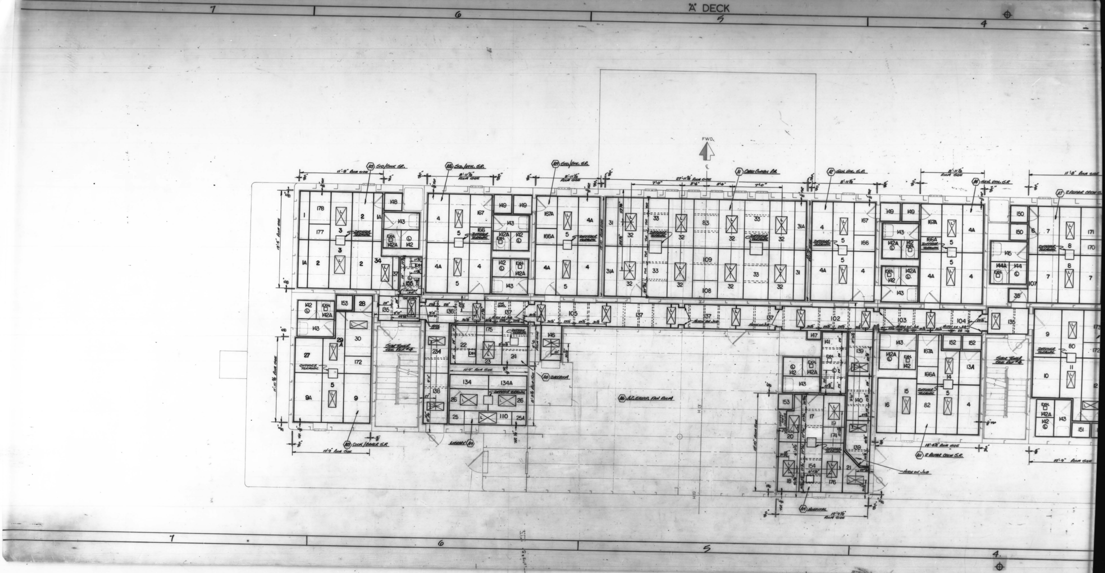
SCALE 3/16" = 1'-0" = 1 FT
DRAWN G. Hinkle
CHECKED JC
SECT MGR J. T. Caputo
DATE COMPL. 12-7-76
EXAMINED T.T. Taylor
AUTHORIZED A. Cooley
DATE 6-27-77
TECH APPROVAL
C S D APPROVAL R.L. Harrington

CEILING ARRANGEMENT
"A" DECK

U S M A DESIGN T11-S-116a
U S M A DWG NO.
HULL NO. 613, 614, 615
DWG NO. 5200-69
REV B
SHEET NO 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS
GROUPING
REMARKS
DATE
MARKED
DEPT.
ORDERED BY DESIGN
YARD PRINTS
GROUP:
MC NO.

5200-69
MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 1
10X


'A' DECK
7
6
5
4
FWD.
STD. COOK S.R.
COOK / BAKER S.R.
A.C. EQUIP. FAN ROOM
LIBRARY
HOSPITAL
STAIR TOWER
DIFFUSER TERMINAL
ROOM SIZE
EXH.
7
6
5
4

5200-69

MICRO-MASTER 105 mm

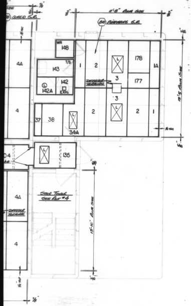
K+E

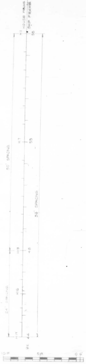
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

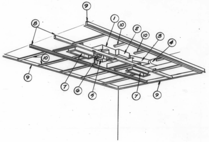
SEPT. '80

10X

FRAME 2







① TERMINAL BOX
② REHEATER CONTROL BOX
③ CONNECTING DUCT
④ MAIN DUCT
⑤ DIFFUSER COLLAR
⑥ JUNCTION BOX
⑦ LIGHT FIXTURE
⑧ TROUGH STRINGERS
⑨ TOP SHOE
⑩ INTERCOSTALS

TYPICAL CREW STATEROOM OVERHEAD ASSEMBLY
DETAIL 2B

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHO	OWNER DATE	OWNER APPD
0		SUBMITTED FOR APPROVAL	3-4-77	RLH	2-3-77 2-10-77	SHELL ZAPATA
A		INITIAL ISSUE: CLG. PNL. NO'S REVISED TO AGREE WITH DETAILS. FURRING AND LIGHT LOCATIONS ADDED TO ROOMS WITHOUT TROUGHS				
B		1) REVISED LIGHT ARRGT. & QUANTITY IN LOUNGE B16 TO SUIT REF. #2. EG. 10-11-77				

AUTHORITY:

GENERAL NOTES:

1. CEILING PANELS SHALL BE .08 ALUM. 'V' JOINTED CONSTRUCTION WITH A BAKED ENAMEL FINISH.
2. CEILING SHALL BE SUPPORTED IN ACCORDANCE WITH TYP. JOINER DETAILS REF. #3
3. ALL CEILING HEIGHTS ARE 7'-0".

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615 614 613	311 310 309	

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS

OWNERS ZAPATA LTR. 2-8-77 D.F. Brown
SHELL LTR. H00V, 2-3-77, G.K. Sumner
NN LTR. 613C/HB200, 3-4-77 R.L. Harrington
ABS N.A.
USPHS 12-20-76 S.R. Rawlings
USCG 1-5-77 J. C. Vitkauskas

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.
H.B. DWG NO. 5200-70
SHT. 1 OF. 1

SCALE 3/8" = 1'-0" = 1 FT
DRAWN G. Hinkle
CHECKED JC
SECT MGR J. T. Cogato
DATE COMPL. 12-7-76
EXAMINED T.T. Taylor
AUTHORIZED A. Conley
DATE 6-27-77
TECH APPROVAL
CSD APPROVAL R.L. Harrington

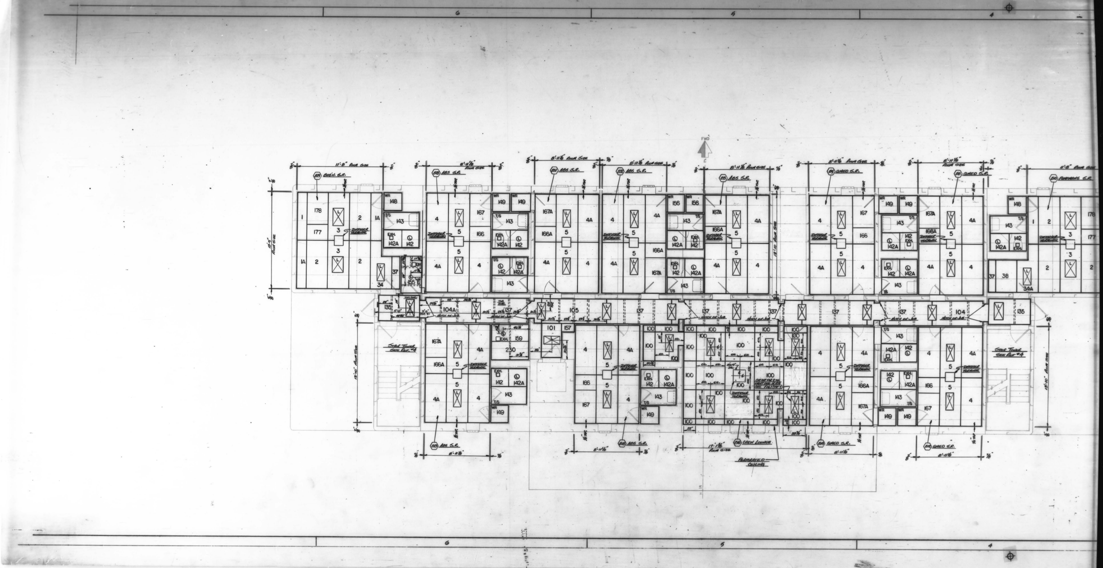
CEILING ARRANGEMENT "B" DECK

USMA DESIGN T11-5-1162
USMA DWG NO.
HULL NO. 613, 614, 615
DWG NO. 5200-70
REV B
SHEET NO. 1 OF 1

NO.	REFERENCES	DWG NO.
5	OVERHEAD ASSEMBLIES (ROOMS WITH TROUGHS)	HB-695
4	JOINER STAIRS	5100-12
3	TYPICAL JOINER DETAILS	5200-75
2	LIGHTING SYSTEMS ARRANGEMENT 'A' DECK	4800-1868
1	JOINER ARRANGEMENT 'B' DECK	5200-69

REPRODUCTION OFFICE
GROUP:
MC NO.

5200-70
MICRO-MASTER 105 mm
K+E
SEPT. '80
FRAME 1
10X


6
5
4
FWD
ABS S.R.
GMED S.R.
CREW LOUNGE
PERFORATED CEILING
STAIR TOWER
ROOM SIZE
DIFFUSER TERMINAL
137
104A
105
104
135
101
157
159
230
143
142
142A
149
148
167
167A
166
166A
100
4
4A
5
6
5
4

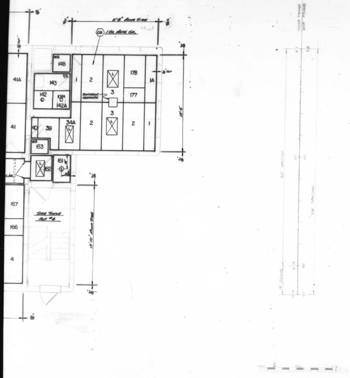
5200-70

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME 2

10X



REV	ZONE	DESCRIPTION	N.N.S.&D.D.CO. DATE	N.N.S.&D.D.CO. AUTHO	OWNER DATE	OWNER APPD
0		SUBMITTED FOR APPROVAL	5-4-77	RLH	2-3-77 2-10-77	SHELL ZAPATA
A		INITIAL ISSUE: CEILING PANELS NO'S. REVISED TO AGREE WITH DETAILS. & FURRING AND LIGHT LOCATIONS ADDED TO ROOMS WITHOUT TRUNKS.				
B	5C 5A	1) LIGHT SIZES & ARRANGEMENT IN OFFICER LOUNGE C1 CHG. TO AGREE WITH REF. #2 2) C16 PANEL 335 ADDED FOR 614 & 615 ONLY.				

AUTHORITY:

GENERAL NOTES:

1. CEILING PANELS SHALL BE .08 ALUM. 'V' JOINTED CONSTRUCTION WITH A BAKED ENAMEL FINISH.
2. CEILING SHALL BE SUPPORTED IN ACCORDANCE WITH TYP. JOINER DETAILS REF. #3
3. ALL CEILING HEIGHTS ARE 7'-0".
4. REFER TO REF #5 FOR TYP. CREW SR. OVERHEAD ASSEMBLY DETAIL.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615 614 613	311 310 309	

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS

OWNERS SHELL LTR MOOV, 2-3-77, G.K. Sumner
ZAPATA LTR., 2-10-77, R.F. Brown
ABS N.A.
USPHS 12-20-76 S.R. Running
NEWPORT NEWS LTR. 6136/H5200 R.L. Harrington
USCG 1-6-77 J. D. Vitkauskas

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.
H.B. DWG NO. 5200-71
SHT. 1 OF. 1

SCALE 3/16" = 1'-0" = 1 FT
DRAWN G. Hinkle
CHECKED JC
SECT MGR J. T. Cogato
DATE COMPL. 12-7-76
EXAMINED T.T. Taylor
AUTHORIZED A. Conley
DATE 6-27-77
TECH APPROVAL
C S D APPROVAL R.L. Harrington

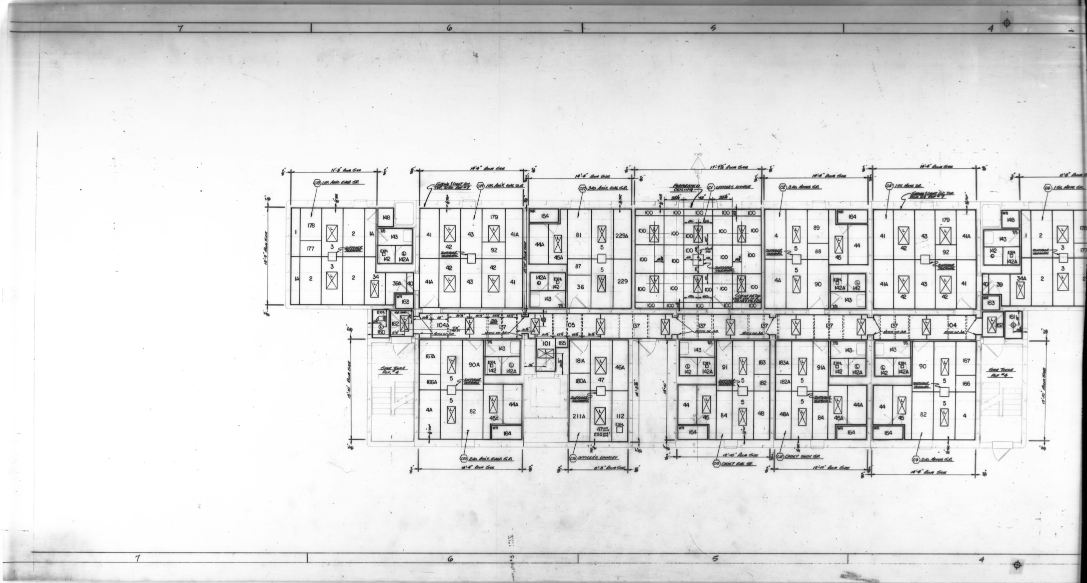
NO.	REFERENCES	DWG NO.
7	CEILING ARRANGEMENT 'D' DECK	5200-72
6	OVERHEAD ASSEMBLIES (ROOMS WITHOUT TRUNKS	HB-875
5	CEILING ARRANGEMENT 'B' DECK	5200-70
4	JOINER STAIRS	5100-12
3	TYPICAL JOINER DETAILS	5200-75
2	LIGHTING SYSTEMS ARRANGEMENT 'C' DECK	4200-1369
1	JOINER ARRANGEMENT 'C' DECK	5200-64

CEILING ARRANGEMENT
"C" DECK

U S M A DESIGN 711 S-1168
U S M A DWG NO.
HULL NO. 613, 614, 615
DWG NO. 5200-71
REV B
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
GROUP:
MC NO.

5200-71
MICRO-MASTER 105 mm
K+E
SEPT. '80
FRAME 1
10X


7
6
5
4
11'-8" Room Size
14'-4" Room Size
17'-7½" Room Size
FWD
C28 1st. Asst. Engr. S.R.
Furring & Light Loc. Typ. Dwg Ref #7
C29 1st. Asst. Eng. D.R.
C27 3rd. Asst. Eng. S.R.
Perforated Ceiling
C1 Officers Lounge
C2 3rd. Mates S.R.
C4 1st. Mate D.R.
C6 1st. Mate S.R.
Stair Tower Ref #4
C20 2nd. Asst. Engr. S.R.
C16 Officer's Laundry
8'-3" Room Size
12'-10" Room Size
C13 Cadet Eng. S.R.
C12 Cadet Deck S.R.
C9 2nd. Mates S.R.
Diffuser Terminal
EXH.
WR
T/S

5200-71

MICRO-MASTER 105 mm

K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

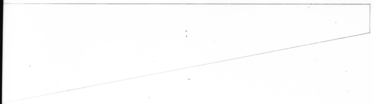
FRAME 2

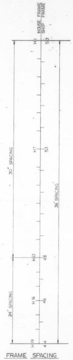
REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHO	OWNER DATE	OWNER APPD
0		SUBMITTED FOR APPROVAL	4-20-77	RLH	3-25-77 4-25-77	SHELL ZAPATA
A		INITIAL ISSUE: CEILING PNL. NO'S. REVISED TO AGREE WITH DWGS. FURRING AND LIGHT LOCATIONS ADDED TO ROOMS WITHOUT TROUGHS.				

AUTHORITY:

GENERAL NOTES:

1. CEILING PANELS SHALL BE .08 ALUM. 'V' JOINTED CONSTRUCTION WITH A BAKED ENAMEL FINISH.
2. CEILING SHALL BE SUPPORTED IN ACCORDANCE WITH TYP. JOINER DETAILS REF. #3
3. ALL CEILING HEIGHTS ARE 7'-0".
4. REFER TO REF. #5 FOR TYPICAL CREW S.R. OVERHEAD ASSEMBLY.





FRAME SPACING

NO.	REFERENCES	DWG NO.
6	OVERHEAD ASSEMBLIES (ROOMS WITHOUT TROUGHS)	HB-875
5	CEILING ARRANGEMENT 'B' DECK	5200-70
4	JOINER STAIRS	5100-12
3	TYPICAL JOINER DETAILS	5200-75
2	LIGHTING SYSTEMS ARRANGEMENT 'D' DECK	4200 1370
1	JOINER ARRANGEMENT 'D' DECK	5200-65

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
613 614 615	311 310 309	

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS

OWNERS SHELL LTR 1563V 3-25-77 G.K.Sommer ZAPATA LTR 4-25-77 DF Brown	ABS N.A.	USPHS 1-7-77	S.R. Rucinus
NEWPORT NEWS LTR 613C/H5200 DTD 4-20-77 RL Harrington	USCG	1-5-77	J.D. Vithoulkas

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

DESIGN DIV. FSCM NO. 43689 DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

H.B. DWG NO. 5200-72
SHT. 1 OF. 1

SCALE 3/16" = 1'-0" = 1 FT
DRAWN G. Hinkle
CHECKED K
SECT MGR J. T. Caputo
DATE COMPL. 12-21-76
EXAMINED T.T. Taylor
AUTHORIZED A. Conley
DATE 6-27-77
TECH APPROVAL
C S D APPROVAL R.L. Harrington

CEILING ARRANGEMENT
"D" DECK

U S M A DESIGN 711-5-1168
U S M A DWG NO.
HULL NO. 613 614 615

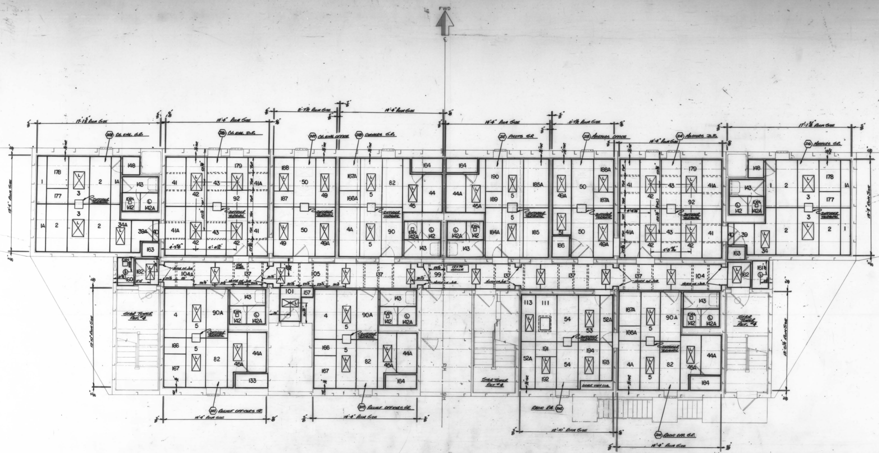
DWG NO. 5200-72
REV A
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS ____ GROUPING ____
REMARKS ____
DATE ____ SIGNED ____

	FIRST ISSUE	DEPT.	NO. PRTS	REV	DATE ISSUED	SPECIAL PRINTS
YARD PRINTS						
ORDERED BY DESIGN						

GROUP: MC NO. ____

5200-72
MICRO-MASTER 105 mm
K+E
SEPT. '80
FRAME 1
10X


7
6
5
4
FWD
17'-1 3/8" Room Size
14'-4" Room Size
8'-7 1/2" Room Size
14'-4" Room Size
D21 Ch. Eng. S.R.
D20 Ch. Eng. D.R.
D19 Ch. Eng. Office
D18 Owners S.R.
14'-4" Room Size
8'-7 1/2" Room Size
14'-4" Room Size
17'-1 3/8" Room Size
D2 Pilots S.R.
D3 Masters Office
D4 Masters D.R.
D6 Masters S.R.
Stair Tower Ref #4
Stair Tower Ref #4
Stair Tower Ref #4
D21 Relief Officers S.R.
D17 Relief Officers S.R.
Radio R.R. D12
D11 Radio Opr. S.R.
14'-4" Room Size
14'-4" Room Size
18'-10" Room Size
14'-4" Room Size
178
177
1
1A
2
3
148
143
EXH.
142
142A
34A
39A
40
163
41
41A
42
43
92
179
188
187
50
49
49A
167A
166A
5
82
90
4A
164
44
44A
45
45A
190
189
185A
184A
185
188A
187A
51
186
39
34
104A
137
105
99
104
101
157
162
161
160
4
90A
166
167
133
113
111
54
53
52A
191
192
193
194
4A
H13
H15

"D" DECK

5200-72

MICRO-MASTER 105 mm

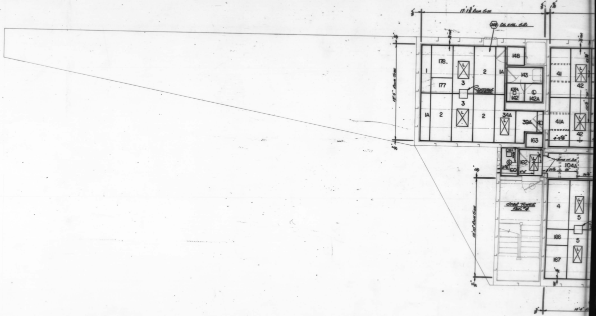
K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 2


178
177
1
1A
2
3
148
143
142
142A
41
42
41A
34A
39A
40
163
160
162
104A
Stair Tower No. 4
4
5
166
167

7

7

5200-72

MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

KEUFFEL & ESSER CO.

SEPT. '80

FRAME 3

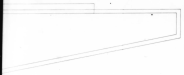
10X

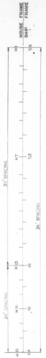
REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHD	OWNER DATE	OWNER APPD
0		SUBMITTED FOR APPROVAL	4-20-77	RLH	3-25-77	SHELL
A	7A	1) CEILING LOWERED TO 6'-9" IN SEA CABIN IN AFT, PORT CORNER. 2) VIEW A-A ADDED & NOTE 3 REVISED				
B	PLAN 7A	1) REV. NAV. AREA TO 48" x 48" PNLS & ADD DIMS. FOR JOB FAB. 2) ADD DET. 7-A 3) DEL. VIEW A-A TO REMOVE 6'-9" CEILING ADDED IN REV. A. & THIS DWG. NOW APPLICABLE TO HULL 615.	2-15-77	RLH	3-15-77	ZAPATA
C		1) INDICATED FURRING NECESSARY TO SUPPORT DIFFUSER TERM. BOXES 2) ADDED LIGHT @ FR 11 @ ℄ 3) ADDED WHISTLE PULL CONTROL RECESS FOR 613/14 AND 615. 4) ADDED ELEC. EQUIP. BOX FOR 613/14 AND 615. 5) RELOCATED LIGHT (FWD, PORT) FOR HULLS 613, 614 TO AVOID INTERFERENCE W/ LOUDHAILER CONTROL. EG 7/21/77				
D	7B K1C	1) MOVE LIGHT INBD 1 PNL (FR10-11) TO CLEAR GIRDER & VENT. 2) ADDED BINNACLE RECESSES FOR MAGNETIC COMPASSES				

AUTHORITY:

GENERAL NOTES:

1. CEILING PANELS SHALL BE .08 ALUM. 'V' JOINTED CONSTRUCTION WITH A BAKED ENAMEL FINISH.
2. CEILINGS SHALL BE SUPPORTED IN ACCORDANCE WITH TYP. JOINER DETAILS REF. #3.
3. ALL CEILING HEIGHTS ARE 7'-0", EXCEPT AS NOTED.





FRAME SPACING

NO.	REFERENCES	DWG NO.
5	JOINER ARRANGEMENT NAV. BR. DK. 615	5200-91
4	JOINER STAIRS	5100-12
3	TYPICAL JOINER DETAILS	5200-75
2	LIGHTING SYSTEMS ARRANGEMENT NAV. BR. DK.	4800-1504
1	JOINER ARRANGEMENT NAV. BR. DK. 613, 614	5200-67

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615 614 613	811 810 809	

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS

OWNERS SHELL LTR. 1562V 3-25-77 GHSumner
ZAPATA LTR 7-15-77 JCP avid
NEWPORT NEWS LTR 613C/H5200 DTD 4-20-77 R.L. HARRINGTON
ABS N.A.
USPHS 1-7-77 S.R. Rumira
USCG 1-6-77 J.D. Vitkauskas

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

H.B. DWG NO. 5200-74
SHT. 1 OF. 1

SCALE 3/16" = 1 FT
DRAWN Gibbons
CHECKED JC
SECT MGR J. T. Congento
TECH APPROVAL
DATE COMPL. 12-21-76
EXAMINED T.T. TAYLOR
AUTHORIZED A. CONLEY
DATE 5-13-77
C S D APPROVAL R.L. HARRINGTON

CEILING ARRANGEMENT
NAV. BR. DECK

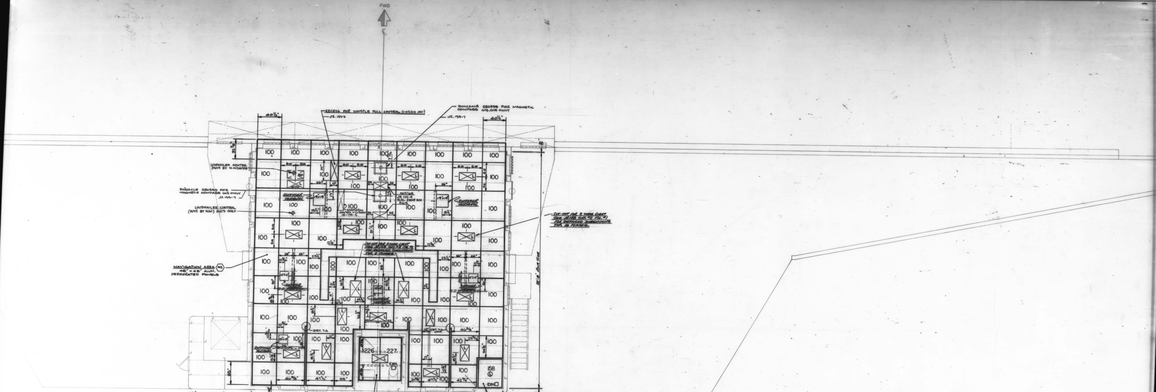
USMA DESIGN 711-5-1162
USMA DWG NO.
HULL NO. 613, 614, 615
DWG NO. 5200-74
REV D
SHEET NO. 1 OF 1

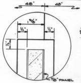
REPRODUCTION OFFICE
GROUP
MC NO.

5200-74

SEPT. '80
FRAME 1
10X

NAV. BRIDGE DECK


FWD
RECESS FOR WHISTLE PULL CONTROL (H-613/614 ONLY)
JR. 133-3
BINNACLE RECESS FOR MAGNETIC COMPASS 613, 614 ONLY
JR. 133-7
40½"
40½"
LOUDHAILER CONTROL (INST. BY N.N.) H613/14
BINNACLE RECESS FOR MAGNETIC COMPASS 613 ONLY JR 133-7
LOUDHAILER CONTROL (INST. BY N.N.) H613 ONLY
DIFFUSER TERMINAL
H613/614 JR 135-4 ELEC. EQUIP BOX H613
CUT-OUT FOR 2 TUBE LIGHT SEE JR128 SHT. #2 FIG. #1 FOR DETAILED DIMENSIONS TYP. 10 PLACES.
CUT-OUT FOR STRIP LIGHT SEE JR128 SHT. #2 FIG. #2 FOR DETAILED DIMENSIONS TYP. 2 PLACES
NAVIGATION AREA N2 48" × 48" ALUM. PERFORATED PANELS
100
L
DET. 7-A
226
227
EXH.
158
EXH
DECK W.C. N1 .08 ALUM NOT PERFORATED
OILSKIN LKR. N3 .08 ALUM. NOT PERFORATED
34'-10" ROOM SIZE
35'-8" ROOM SIZE
48"
48"
7/8"
7
6
5
4


1⅜"
½"
½"
½"
7/8" PANEL

DETAIL 7-A

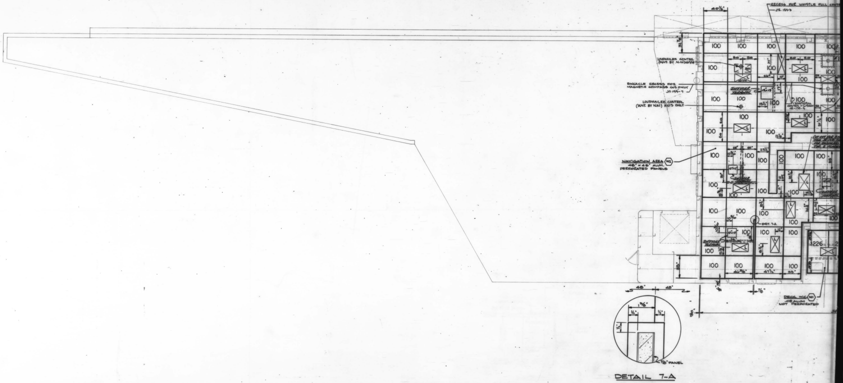
5200-74

SEPT. '80

10X

FRAME 2

NAV. BRIDG



FWD
RECESS FOR WHISTLE PULL CONT
JR 155-3
40½"
32⅞"
LOUDHAILER CONTROL (INST. BY N.N.) H613/14
BINNACLE RECESS FOR MAGNETIC COMPASS G15 ONLY
JR 155-7
LOUDHAILER CONTROL (INST. BY N.N.) H613 ONLY
DIFFUSER TERMINAL
WHISTLE PULL CONTROL
JR-155-3
NAVIGATION AREA
N2
48" × 48" ALUM. PERFORATED PANELS
100
226
L
DET. 7-A
46⅝"
47½"
33"
35"
48"
48"
7/8"
DECK W.C.
N1
.05 ALUM NOT PERFORATED
1⅝"
½"
½"
½"
⅞" PANEL
DETAIL 7-A

7

5200-74

MICRO-MASTER 105 mm

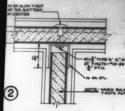
K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

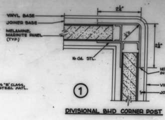
SEPT. '80

10X

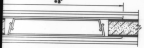
FRAME 3


10-24 ALUM T-NUT AT TOP, BOTTOM & CENTER
1¾"
10 x ¾" TYPE 'A' 12" O.C. AT T-NUTS—#10-24 ¾" P.T.H.
16 GA. STL.
NOTE: WHEN BULKHEAD IS "B" CLASS, T-NUTS MUST BE STEEL MAT'L.

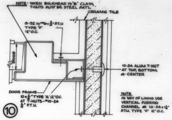
② INTERSECTION OF PANELS


VINYL BASE
JOINER BASE
MELAMINE, MARINITE PANEL (TYP.)
2¼"
2¼"
16 GA. STL.
NOTCH LOOSE IN WAY OF POST
VINYL BASE (TYP.)
JOINER BASE (TYP.)

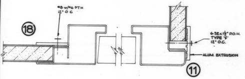
① DIVISIONAL BHD CORNER POST

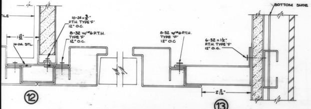


DIVISIONAL BHD MULTICOUPLER OUTLET POST ⑨

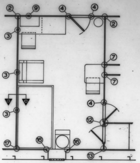

NOTE: WHEN BULKHEAD IS "B" CLASS, T-NUTS MUST BE STEEL MAT'L.
CERAMIC TILE
8-32 w/#6 x ½" P.T.H. TYPE 'F' 12" O.C.
DOOR
10-24 ALUM. T-NUT AT TOP, BOTTOM, & CENTER
DOOR FRAME
10 x ¾" TYPE 'A' 12" O.C. AT T-NUTS—#10-24 ¾" P.T.H.
NOTE: IN WAY OF LINING USE VERTICAL FURRING CHANNEL & 10-24 x 1¼" P.T.H. TYPE 'F' 12" O.C.

⑩ INTERSECTION OF DOOR JAMB AT BHD


⑱
#8 w/#6 P.T.H. 12" O.C.
6-32 x 1½" P.O.H. TYPE 'F' 12" O.C.
ALUM. EXTRUSION
⑪


TILE
1 19/32"
16 GA. STL.
10-24 x ⅜" P.T.H. TYPE 'F' 12" O.C.
8-32 w/#6 P.T.H. TYPE 'F' 12" O.C.
8-32 w/#6 P.T.H. TYPE 'F' 12" O.C.
6-32 x 1½" P.T.H. TYPE 'F' 12" O.C.
BOTTOM SHOE
2 9/16"
⑫
⑬

DIVISIONAL BHD'S AT WARDROBE DOORS


②
⑨
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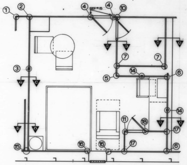
TYP. CREW S.R.

½" = 1'-0"


①
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REF #18
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⑯
⑰

TYP. OFFICER'S S.R.

½" = 1'-0"

REV	ZONE	DESCRIPTION	DATE	AUTHOR	OWNER DATE	APPD
O		INITIAL ISSUE				
A		APP OWNERS APPROVAL	8-19-76	[illegible]	8-11-76 7-7-76	A.W.(S) D.B.(Z)
B	[illegible]	ENLARGED SECT. "A-A" & ISOMETRIC VIEW OF 'B' BHD TO SUIT DESIGN DEVELOPMENTS [illegible]				
C	1A	1. ADDED COAST GUARD AND USPHS APPROVALS. 2. ADDED NOTE TO DETAIL 2 & 10.				

AUTHORITY:

GENERAL NOTES:

1. THE DETAILS SHOWN HEREON, SHOW TYPICAL JOINER ERECTION OF PANELS AND TRIM WITHIN THE QUARTERS.
2. ALL DETAILS OF INSTALLATION SHALL CONFORM TO U.S.C.G. REGULATIONS.
3. ALL MATERIAL USED FOR THE CONSTRUCTION OF JOINER BULKHEADS, LININGS AND CEILINGS SHALL BE INCOMBUSTIBLE IN COMPLIANCE WITH U.S.C.G. EQUIPMENT LIST CG 190.
4. JOINER BULKHEADS AND LININGS ARE FACTORY LAMINATED, FIRE RESISTANT MELAMINE, VENEERED TO AN INCOMBUSTIBLE CORE. DIVISIONAL PANELS (CONFORMING TO M.A. SPEC. 52 MA 5 TYPE II, CLASS 5) SHALL BE VENEERED ON BOTH SIDES FORMING A PANEL OF 1⅛" OVERALL THICKNESS. LINING PANELS (CONFORMING TO M.A. SPEC. 52 MA 5 TYPE II, CLASS 2) SHALL BE MELAMINE VENEERED ON EXPOSED SIDE AND WITH MELAMINE BACKING ON UNEXPOSED SIDE FORMING A PANEL OF 5/8" OVERALL THICKNESS. THE MATERIAL OF THE INCOMBUSTIBLE CORE OR SUBSTRATE IS TO BE J.M. MARINITE 36 USCG [illegible] APPVL. # 164.009/[illegible]. THE FACTORY LAMINATE CONFORMS IN ALL RESPECTS TO THOSE TESTED AND FOUND ACCEPTABLE BY UNDERWRITERS LABORATORIES INC. AS STATED IN THEIR REPORT DATED JUNE 23, 1960 FILE [illegible] AND ARE IN ACCORDANCE WITH THE REQUIREMENTS C.G. # 190, SUBPART 164/012/2/10 & 164/015/4/0.
5. MELAMINE VENEERS USED FOR BULKHEADS AND LININGS SHALL BE THOSE LISTED IN U.S.C.G. EQUIPMENT LIST DATED 1 AUGUST 1973; i.e. "CONSOWELD" LAMINATED PLASTIC, #s 164.012/2/0.
6. CEILINGS SHALL BE .032 ALUM., V-JOINT CONSTRUCTION, FINISHED IN FACTORY BAKED ENAMEL.
7. ALL FURRING MEMBERS ARE TO BE STEEL, GAUGES SHOWN, BONDERIZED AND FACTORY BAKED PRIME. "H" POSTS AND ALL VERTICAL TRIM TO BE STEEL, BAKED ENAMEL, FACTORY FINISHED TO HARMONIZE WITH COLOR OF MELAMINE SURFACES. WHERE TRIM MEMBERS ARE ADJACENT TO EXTERIOR DOORS AND SIMILAR EXPOSED AREAS THEY SHALL BE STAINLESS STEEL, AND FACTORY ENAMELED. CEILING CORNICE TO BE ALUMINUM EXTRUSION, FACTORY FINISHED TO HARMONIZE WITH CEILING PANELS.
8. SPACING FOR CEILING FURRING MEMBERS SHALL BE SPACED NO MORE THAN 24"x48".
9. HINGED CEILING ACCESS METAL PANELS WITH POSITIVE FASTENING WILL BE FURNISHED WHERE FREQUENT ACCESS IS REQUIRED.
10. ALL FASTENINGS TO BE CADMIUM PLATED STEEL, EXCEPT ALL EXPOSED SCREWS TO BE CRES. AND TO HAVE PHILLIPS HEADS, PAINTED TO HARMONIZE WITH ADJACENT MATERIAL. SCREWS FOR CEILING TRIM ARE CRES.
11. DRAFTSTOPS BETWEEN THE TOPS OF FREESTANDING JOINER BULKHEADS AND THE DECKHEAD SHALL BE PROVIDED WHERE BULKHEADS ARE RATED "B" CLASS. DRAFTSTOP MATERIAL TO BE STEEL, IN GAUGES SHOWN.
12. TRIM IN SHOWER SPACES SHALL BE EITHER EXTRUDED ALUM. OR STAINLESS STEEL, SEE REF. # 9 FOR DETAILS.

LIST OF ABBREVIATIONS

ALUM	ALUMINUM
APPVL	APPROVAL
ARRGT	ARRANGEMENT
BHD	BULKHEAD
CONT	CONTINUOUS
CRES	CORROSION RESISTANT STEEL
DIA	DIAMETER
DIM	DIMENSION
DIV	DIVISIONAL
DK	DECK
EXT	EXTERIOR
FIN	FINISH
GA	GAUGE
INT	INTERIOR
J.M.	JOHNS MANVILLE
M.A.	MARITIME ADMINISTRATION
MIN	MINIMUM
O.C.	ON CENTER
OV'HD	OVERHEAD
PERF	PERFORATED
P.F.H.	PHILLIPS FLAT HEAD
PNL	PANEL
P.O.H.	PHILLIPS OVAL HEAD
P.T.H.	PHILLIPS TRUSS HEAD
REF	REFERENCE
S.M.	SHEET METAL
S.R.	STATEROOM
STL	STEEL
TYP	TYPICAL
USCG	UNITED STATES COAST GUARD
W/	WITH
W.R.	WARDROBE

NO	REFERENCES	DWG NO.
20	CARPET ARRGT.	5500-103
19	WINDOW CURTAINS	8200-82
18	CEILING ARRGTS	5200-68 to 74
17	JOINER INSULATION	7000-110
16	DECK COVERING	5500-102
15	INT. JOINER DOORS	5250-65
14	EXT. JOINER DOORS	5250-64
13	FIRE STATIONS	2400-1051
12	W.R. DOORS	5250-67
11	WINDOW CASINGS	5200-78
10	WHEELHOUSE WINDOWS	8400-52
9	SHOWERS, ARRGT & DETAILS	5200-76
8	S.M. SHEATHING	7000-111
7	JOINER STAIRS	5100-18
6	JOINER ARRANGEMENT NAV. BR. DECK	67
5	JOINER ARRANGEMENT "D"	65
4	JOINER ARRANGEMENT "C"	64
3	JOINER ARRANGEMENT "B"	63
2	JOINER ARRANGEMENT "A" DECK	62
1	JOINER ARRANGEMENT CAMBER DECK	5100-61

NNS & DD CO HULL NO.	MARAD HULL NO.
615	311
614	310
613	309

SHIPS NAME

390,000 DWT. BULK OIL CARRIER (U.L.C.C.)

APPROVALS

OWNERS 8/12/76 A. Wilson (SHELL) 7/7/76 DB (ZAPATA)
ABS N.A.
USPHS 11/26/76 J.R. [illegible]
NEWPORT NEWS 8/19/76 E.B. [illegible]
USCG 8/20/76 J.D. [illegible]

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

SCALE F.S. & AS NOTED
DRAWN L. BELL
CHECKED [illegible]
SECT MGR J. T. [illegible]
DATE COMPL. 6-1-76
EXAMINED
AUTHORIZED
DATE
TECH APPROVAL
C S D APPROVAL

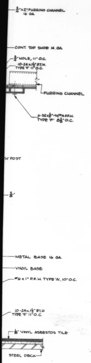
TYPICAL JOINER DETAILS

U S M A DESIGN T11-S-116a
U S M A DWG NO.
HULL NO. 613, 614, 615
DWG NO. 5200-75
REV C
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS
REMARKS
DATE
ORDERED BY DESIGN
GROUP:
NC NO.

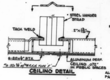
5200-75

SEPT. '80
10X
FRAME 1



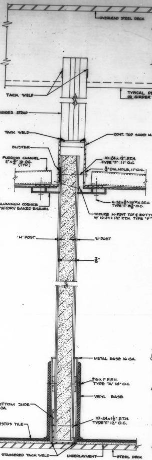
¾"×2" FURRING CHANNEL 16 GA.
CONT. TOP SHOE 14 GA.
⅜" HOLE, 11" O.C.
10-24×1½" P.T.H. TYPE 'F' 11" O.C.
FURRING CHANNEL
6-32×½"-W/#4 P.F.H. TYPE 'F' 8⅝" O.C.
'H' POST
⅝"
METAL BASE 16 GA.
VINYL BASE
#6×1" P.F.H. TYPE 'A', 10" O.C.
10-24×1½" P.T.H TYPE 'F' 11" O.C.
⅛" VINYL ASBESTOS TILE
STEEL DECK

ELL



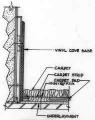
STEEL HANGER STRAP
TACK WELD
2"×1½"
6-20×½" P.T.H.
#6-32×⅜" W/#4 P.F.H. TYPE 'F'
ALUMINUM PERF. CEILING .072" IN PUBLIC SPACES

CEILING DETAIL



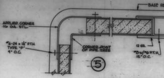
OVERHEAD STEEL DECK
TACK WELD
TYPICAL DECK BEAM OR GIRDER
STEEL HANGER STRAP 16 GA.
TACK WELD
CONT. TOP SHOE 14 GA.
BLISTER
FURRING CHANNEL 2"×¾" 16 GA. (TYP.)
10-24×1½" P.T.H. TYPE 'F' 11" O.C.
⅜" DIA. HOLE, 11" O.C.
ALUMINUM CORNICE FACTORY BAKED ENAMEL
6-32×½" W/#4 P.F.H. TYPE 'F' 8⅝" O.C.
SECURE H-POST TOP & BOTTOM W/ 10-24×1½" P.T.H. TYPE "F"
'H' POST
'H' POST
⅞"
METAL BASE 16 GA.
#6×1" P.F.H. TYPE "A" 16" O.C.
VINYL BASE
BOTTOM SHOE 14 GA.
⅛" VINYL ASBESTOS TILE
10-24×1½" P.T.H. TYPE 'F' 12" O.C.
STAGGERED TACK WELD
UNDERLAYMENT
STEEL DECK

TYPICAL DIVISIONAL BHD
SECTION 7-A



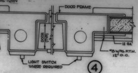
VINYL COVE BASE
CARPET
CARPET STRIP
CARPET PAD
10-24×¾" P.T.H.
UNDERLAYMENT

CARPET DETAIL



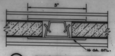
APPLIED CORNER 16 GA. STL.
#6-24×1½" P.T.H. TYPE "F" 9" O.C.
CORNER POST OF PIPE TREE
BASE RETURN

⑤ DIVISIONAL BHD CORNER POST AT DOOR

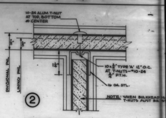


DOOR FRAME
12 GA.
#8 W/#6 P.T.H. 12" O.C.
DOOR (TYP.)
12 GA.
#8 W/#6 P.T.H. 12" O.C.
LIGHT SWITCH WHERE REQUIRED

④ DIVISIONAL BHD DOOR JAMB WITH SWITCH

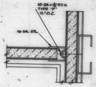


③ DIVISIONAL "H" POST



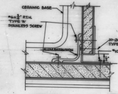
10-24 ALUM. T-NUT AT TOP, BOTTOM & CENTER
DIVISIONAL PNL.
LINING PNL.
1¼"
10×½" TYPE 'A' 12" O.C. AT T-NUTS—#10-24 ½" P.T.H.
16 GA. STL.
NOTE: WHEN BULKHEAD IS T-NUTS MUST BE

② INTERSECTION OF PANELS



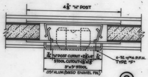
10-24×1½" P.T.H. TYPE "F" 12" O.C.
16 GA. STL.

INTERSECTION OF LINING PANELS AT PIPE CHASE ⑥



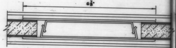
CERAMIC BASE
#6×¾" P.T.H. TYPE 'A' STAINLESS SCREW
ALUM. EXTRUSION
10-24×1½" P.T.H. TYPE 'F'
#10×¾" P.T.H.

INTERSECTION OF PIPE CHASE AT DIV. BHD ⑦

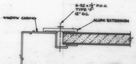


4⅞" "H" POST
"H" POST CUTOUT = 2⅝"×4"
STOOL CUTOUT = 2⅝"×2⅝"
3"×5" STOOL
.051" ALUM. (BAKED ENAMEL FIN.)
6-32 W/#4 P.F.H. TYPE "F"

DUPLEX OUTLET POST IN DIVISIONAL BHD ⑧

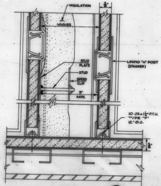


DIVISIONAL BHD MULTICOUPLER OUTLET POST ⑨



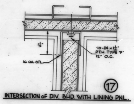
WINDOW CASING
6-32×1½" P.O.H. TYPE "F" 12" O.C.
ALUM. EXTRUSION

⑯ WINDOW CASING CONNECTION



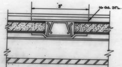
INSULATION
⅝"
VARIES
STUD PLATE
STUD
SPEED CLIP
5" MIN.
LINING "H" POST (STAGGER)
10-24×1½" P.T.H. TYPE "F" 12" O.C.
⅝"

DOUBLE BHD ⑮



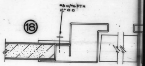
1¼"
16 GA. STL.
10-24×1½" P.T.H. TYPE 'F' 12" O.C.

⑰ INTERSECTION OF DIV. BHD WITH LINING PNL.

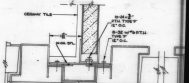


LINING "H" POST ⑭

⑱



#8 W/#6 P.T.H. 12" O.C.



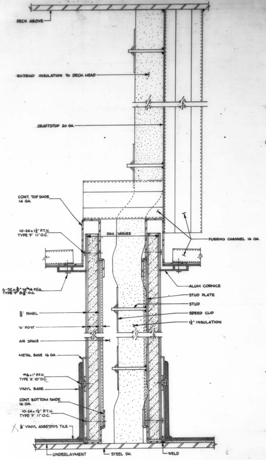
CERAMIC TILE
1⅛"
16 GA. STL.
10-24×½" P.T.H. TYPE 'F' 12" O.C.
8-32 W/#6 P.T.H. TYPE 'F' 12" O.C.

⑫ DIVISIONAL BHD'S AT WARDRO

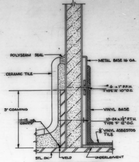
5200-75

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

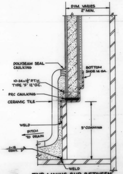
SEPT. '80
10X
FRAME 2


DECK ABOVE
EXTEND INSULATION TO DECK HEAD
DRAFTSTOP 20 GA.
CONT. TOP SHOE 14 GA.
10-24 x 1½" P.T.H. TYPE 'F' 11" O.C.
DIM. VARIES
FURRING CHANNEL 16 GA.
6-32 x ¾" W/#4 P.F.H. TYPE 'F' 8⅝" O.C.
ALUM. CORNICE
STUD PLATE
STUD
SPEED CLIP
1½" INSULATION
⅝" PANEL
'H' POST
AIR SPACE
METAL BASE 16 GA.
#6 x 1" P.F.H. TYPE 'A' 10" O.C.
VINYL BASE
CONT. BOTTOM SHOE 16 GA.
10-24 x 1½" P.T.H. TYPE 'F' 11" O.C.
X ⅛" VINYL ASBESTOS TILE
UNDERLAYMENT
STEEL DK.
WELD

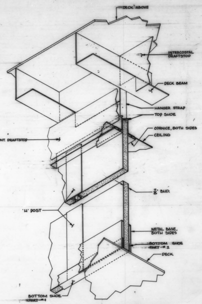
SOUND INSULATED BHD.
SECTION 11-A


POLYSEAM SEAL
CERAMIC TILE
METAL BASE 16 GA.
#6 x 1" P.F.H. TYPE 'A' 10" O.C.
3" COAMING
1-12 CONT.
VINYL BASE
10-24 x 1½" P.T.H. TYPE 'F' 12" O.C.
⅛" VINYL ASBESTOS TILE
STL. DK.
WELD
UNDERLAYMENT

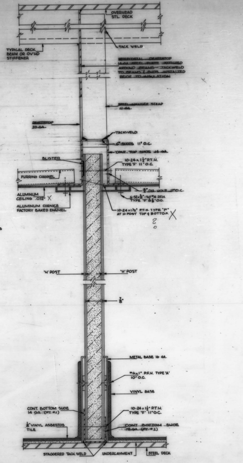
TYP. DIV. BHD. BETWEEN TOILET SIDE & S.R. SIDE
SECTION 10-C


DIM. VARIES
2" MIN.
POLYSEAM SEAL CAULKING
BOTTOM SHOE 14 GA.
10-24 x 1½" P.T.H. TYPE 'F' 12" O.C.
PRC CAULKING
CERAMIC TILE
WELD
PITCH TO DRAIN
3" COAMING
1-12 CONT.
WELD

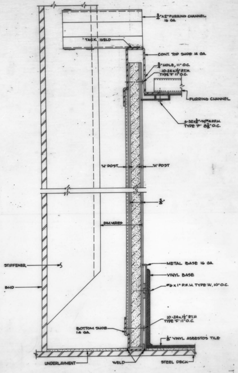
TYP. LINING BHD. BETWEEN SHOWER SIDE & STL. BHD.
SECTION 10-A


DECK ABOVE
INTERCOSTAL DRAFTSTOP
DECK BEAM
HANGER STRAP
TOP SHOE
CORNICE, BOTH SIDES
CEILING
CONT. DRAFTSTOP
⅞" BHD.
'H' POST
METAL BASE, BOTH SIDES
BOTTOM SHOE PART #2
DECK
BOTTOM SHOE PART #1

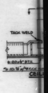
ISOMETRIC VIEW OF 'B' BHD. CONSTRUCTION


OVERHEAD STL. DECK
TACK WELD
TYPICAL DECK BEAM OR OV'HD STIFFENER
INTERCOSTAL DRAFTSTOP 14 GA. STEEL PLATE NOTCHED AROUND BEAMS – TACKWELD TO BEAMS & BHDS. INSTALLED PRIOR TO INSULATION
STEEL HANGER STRAP 11 GA.
DRAFTSTOP 20 GA.
TACKWELD
6" SLOTS 11" O.C.
CONT. TOP SHOE 14 GA.
BLISTER
10-24 x 1½" P.T.H. TYPE 'F' 11" O.C.
FURRING CHANNEL
ALUMINUM CEILING .072" X
ALUMINUM CORNICE FACTORY BAKED ENAMEL
⅜" DIA. HOLE 11" O.C.
6-32 x ¾" - W/#4 P.F.H. TYPE 'F' 8⅝" O.C.
10-24 x 1½" P.T.H. TYPE "F" AT H-POST TOP & BOTTOM X
2 0
'H' POST
'H' POST
⅞"
METAL BASE 16 GA.
#6 x 1" P.F.H. TYPE 'A' 10" O.C.
VINYL BASE
CONT. BOTTOM SHOE 14 GA. (PT. #1)
10-24 x 1½" P.T.H. TYPE 'F' 11" O.C.
⅛" VINYL ASBESTOS TILE
CONT. BOTTOM SHOE 18 GA. (PT. #2)
STAGGERED TACK WELD
UNDERLAYMENT
STEEL DECK

TYPICAL DIVISIONAL BHD. CLASS 'B'
SECTION 9-A


¾" x 2" FURRING CHANNEL 16 GA.
TACK WELD
CONT. TOP SHOE 14 GA.
¾" HOLE, 11" O.C.
10-24 x 1½" P.T.H. TYPE 'F' 11" O.C.
FURRING CHANNEL
6-32 x ½" - W/#4 P.F.H. TYPE 'F' 8⅝" O.C.
'H' POST
'H' POST
⅝"
DIM. VARIES
STIFFENER
BHD
METAL BASE 16 GA.
VINYL BASE
#6 x 1" P.F.H. TYPE 'A', 10" O.C.
10-24 x 1½" P.T.H. TYPE 'F' 11" O.C.
BOTTOM SHOE 14 GA.
⅛" VINYL ASBESTOS TILE
UNDERLAYMENT
WELD
STEEL DECK

TYPICAL LINING BHD AT SHELL
SECTION 8-A

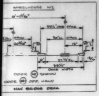

TACK WELD
6-20 x ¼" P.T.H.

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 3

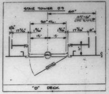
5200-75

DOOR SCHEDULE

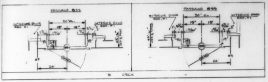
ITEM NO.	DOOR NO	DECK	SWING	CLEAR WIDTH	CLEAR HEIGHT	SILL HEIGHT	STEEL CUT W	STEEL CUT H	COAM'G HEIGHT	LOCK	FIXED LIGHT	JAMB DEPTH	PITCH	REMARKS	WATER SHED REQ'D
1	N2	NAV. BRIDGE		30	72½	6	37⅝	75⅝	4¼	25	27⅛x28⅜	7½"	SQ.		SEE DETS.
2	N2-1	↓		30	72½	6	37⅝	75⅝	4¼	25	27⅛x28⅜	7½"			SEE DETS.
3															
4	D9-1	"D"		30	72½	6	35	77½	3½	91	8x12	9½"			YES
5															
6	B33	"B"		30	72½	6	35	77½	3½	91	8x12	6½"			YES
7	B33-1	↓		30	72½	6	35	77½	3½	91	8x12	6½"			YES
8															
9	A15-1	"A"		30	72½	6	35	77½	3½	91	8x12	7"			YES
10	A16-1			36	72½	6	41	77½	3½	91	NONE	—			YES
11	A30			30	72½	6	35	77½	3½	91	8x12	7"			YES
12	A30-1	↓		30	72½	6	35	77½	3½	91	8x12	9½"			YES
13															
14	R1-1	CAMBER		30	69½	9	35	74½	6½	91	8x12	9½"			YES
15	R2-1			30	69½	9	35	74½	6½	91	8x12	9½"			YES
16	R10			30	69½	9	35	74½	6½	91	NONE	9½"			YES
17	R14-1	↓		30	69½	9	35	74½	6½	91	NONE	9½"	↓		YES
18															
19															
20															


WHEELHOUSE N2
6'-0⅜"
33⅞" CLR OPNG
30" CL OPNG
15"
27⅞" CL
38⅝"
DOOR WIDTH
DOOR (N2) SHOWN
DOOR (N2-1) OPP. HAND

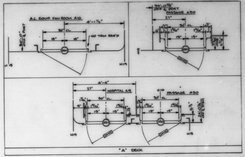
NAV. BRIDGE DECK


STAIR TOWER D9
40"
45'-6"
30" CL.
15"
15"
17⅞"
17⅞"

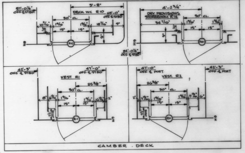
"D" DECK


PASSAGE B33
INTERIOR DOOR REF. #1
30" CL.
15"
15"
24"
H7
PASSAGE B33
INTERIOR DOOR REF. #1
30" CL.
15"
15"
24"
H7

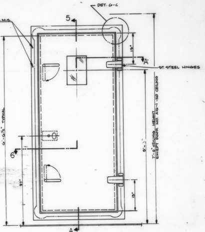
"B" DECK


A.C. EQUIP. FAN ROOM A16
4'-1½"
36" CL
18"
18"
NO TRIM REQ'D
H15
H19
34'-0⅝" OFF & PORT
PASSAGE A30
27"
30" CL.
15"
15"
H15
4'-4"
27"
HOSPITAL A15
30" CL.
15"
15"
PASSAGE A30
30" CL.
15"
15"
H19
H15

"A" DECK


51'-0½" OFF & STBD
DECK WC R10
5'-8"
68'-0" OFF & STBD
30" CL.
15"
15"
DRY PROVISIONS STOREROOM R14
4'-2¾"
34⅞"
30" CL.
15"
15"
34'-0⅜" OFF & STBD
41'-3" OFF & STBD
VEST R1
47'-0" OFF & STBD
25⅜"
30" CL.
15"
15"
H19
47'-0" OFF & PORT
VEST R2
42'-3" OFF & PORT
26⅜"
30" CL.
15"
15"
H19

CAMBER DECK


DET. 6-C
5
¼-20 T.H.M.S. 8" O.C.
ST. STEEL HINGES
A
6'-6½" TYPICAL
6
5'-3"
7'-0" CEILING HEIGHT EXCEPT DOOR NO. A16-1 - NO CEILING
13"
13"
37"
A

TYPICAL HINGED DOOR ELEVATION 4-A

SCALE: 1½" = 1'-0"

REVISIONS

REV	ZONE	DESCRIPTION	NNS & DD CO DATE	NNS & DD CO AUTH	OWNER DATE	OWNER APPD
0		SUBMITTED FOR APPROVAL			2-2-77	SHELL
A	8,9,10 8,9,10 1,6	1) FIXED LIGHT HEIGHT 28⅛ WAS 27⅞ REVISE OTHER DWGS. TO AGREE 2) LINING CHANGED FROM ⅝ TO ⅞ IN WHEELHOUSE REVISE DWGS. OF SLIDING DOOR TO SUIT 3) GENERAL NOTE 10 AND DETAILS 6A & 6B REVISED GH 3/1/77 RE-SUBMITTED FOR APPROVAL	6-23-77	RLH	6-10-77	SHELL
B	ALL 4D 8B 8A,10 10A	1) REV. TO MAKE DWG. FOR 613/614 ONLY 2) REV. NB. PLAN) 6'-0⅜ WAS 6'-1⅜" 20⅞" WAS 19⅞" 3) ELEV. 8-A) 5½" WAS ½" TO SUIT 613/614/615 4) REVISED GUIDE ROLLER. 5) REVISED SILL DEPTH. ERL 8/8/77 — INITIAL ISSUE —				

AUTHORITY:

GENERAL NOTES:

1. DOORS & FRAMES TO BE STAINLESS STEEL CONTRUCTION, GAUGES AS SHOWN.
2. DOORS & FRAMES TO HAVE FACTORY APPLIED BAKED ON WHITE FINISH.
3. DOORS TO BE OF STIFFENED CONSTRUCTION.
4. HINGED DOORS TO BE EQUIPPED WITH CONC. IN HEAD CLOSER TYPE LCN 5015.
5. DOORS TO BE FURNISHED WITH HOLD OPEN HOOK.
6. TEMPLATE ALL WORK PRIOR TO ERECTION.
7. ALL FASTENERS SHALL BE 316 STAINLESS STEEL.
8. ALL MATERIALS FOR DOORS, FRAMES FLASHING ETC. SHALL BE STAINLESS STEEL GRADE 316.
9. LOCK CYLINDERS SHALL BE AS MANUF. BY FALCON LOCK CO. (FOR KEYING WITHIN SHIPS MASTER KEY SYSTEM) & AS PER REF. #.9.
10. HINGES & DOGS TO BE EQUIPPED WITH SELF-LUBRICATING NYLON SHOULDERED BUSHINGS.
11. LOCKING DOGS ARE SO DESIGNED THAT WHEN THE DOGS ARE UNLATCHED THEY ARE RETAINED IN OPEN POSITION BY AN INTEGRAL INTERNAL MECHANISM.
12. DOORS TO BE SOUND DEADENED & FILLED WITH 3½# DENSITY ROCKWOOL INSULATION.
13. SLIDING DOOR LATCHES TO BE HEAVY DUTY MARINE TYPE, BRONZE SATIN FINISH WITH LEVER ON BOTH SIDES OF DOOR. (# 19-65 LATCH) CYLINDER TO BE MOUNTED IN DOOR HEAD ON BOTH SIDES. (# 25 CYLINDER) SEE REF. # 9 FOR DESCRIPTION.

NO	REFERENCES	DWG NO
11	WINDOWS & WIPERS IN WHEELHOUSE	5400-52
10	MISC. JOINER HARDWARE	5300-550
9	LOCKS, CYLINDERS, KEYS & TAGS	5250-66
8	↑ SHT. 3	1270-643
7	SHT. 2	1270-642
6	DECK HOUSE ENCLOSURES SHT. 1	1270-641
5	↑ NAV. BRIDGE DECK	5200-67
4	"D" DECK	5200-65
3	"B" DECK	5200-63
2	"A" DECK	5200-62
1	JOINER ARRANGEMENT CAMBER DECK	5200-61

NNS & DD CO HULL NO	MARAD HULL NO	SHIPS NAME
614 613	310 309	

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS
OWNERS SHELL LTR. 1916V. 2-2-77 G.K. Summers | ABS N.A. | USPHS 11-26-76 S.R. Rivera
NEWPORT NEWS LTR 613C/H5250 6-23-77 R.L. Howington | USCG 12-10-76 J.D. Vittaiacker

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV
FSCM NO 43689
DEPT

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

SCALE AS NOTED EXCEPT ¾" 1 FT
DRAWN GLV
CHECKED JC
SECT MGR J. F. Cogut
DATE COMPL. 11-15-76
EXAMINED
AUTHORIZED
DATE
TECH APPROVAL
CSD APPROVAL

EXTERIOR JOINER DOORS

USMA DESIGN T11-S-116a
USMA DWG NO
HULL NO 613,614
DWG NO. 5250-64
REV B
SHEET NO 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS
ORDERED BY DESIGN
GROUP
MC NO

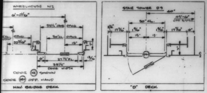
JZ 159 & 160

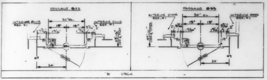
5250-64

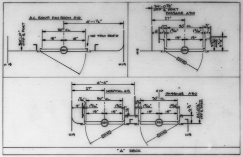
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
10X
FRAME 1

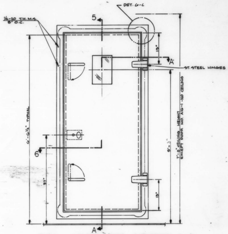
DOOR SCHEDULE

ITEM NO.	DOOR NO	DECK	SWING	CLEAR WIDTH	CLEAR HEIGHT	SILL HEIGHT	STEEL CUT "W"	STEEL CUT "H"	COAM'G HEIGHT	LOCK	FIXED LIGHT	JAMB DEPTH	PITCH	REMARKS	WATER SHED REQ'D
1	N2	NAV. BRIDGE		30	72½	6	37⅜	75⅝	4¾	25	27½x28½	7½"	SQ		SEE DETS
2	N2-1	↓		30	72½	6	37⅜	75⅝	4¾	25	27½x28½	7½"			SEE DETS
3															
4	D9-1	"D"		30	72½	6	35	77½	3½	91	8x12	9⅛"			YES
5															
6	B33	"B"		30	72½	6	35	77½	3½	91	8x12	6½"			YES
7	B33-1	↓		30	72½	6	35	77½	3½	91	8x12	6½"			YES
8															
9	A15-1	"A"		30	72½	6	35	77½	3½	91	8x12	7"			YES
10	A16-1			36	72½	6	41	77½	3½	91	NONE	—			YES
11	A30			30	72½	6	35	77½	3½	91	8x12	7"			YES
12	A30-1	↓		30	72½	6	35	77½	3½	91	8x12	9½"			YES
13															
14	R1-1	CAMBER		30	69½	9	35	74½	6½	91	8x12	9½"			YES
15	R2-1			30	69½	9	35	74½	6½	91	8x12	9½"			YES
16	R10			30	69½	9	35	74½	6½	91	NONE	9½"			YES
17	R14-1	↓		30	69½	9	35	74½	6½	91	NONE	9½"	↓		YES
18															
19															
20															


WHEELHOUSE N2
6'-0¹/₁₆"
39¼" HMS OPNG
30" CL
20⁷/₁₆"
27½" FRL
33½"
DOOR WIDTH
DOOR N2 SHOWN
CODE N2-1 OPP. HAND
NAV. BRIDGE DECK
STAIR TOWER D9
40"
30" CL.
15"
15"
17¹/₁₆"
"D" DECK

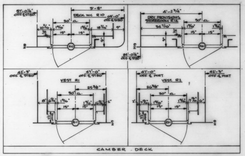

PASSAGE B33
INTERIOR DOOR REF. #1
30" CL.
15"
15"
24"
"B" DECK


A.C. EQUIP. FAN ROOM A16
4'-1½"
36" CL.
18"
18"
NO TRIM REQ'D
39'-0⅜" OFF ℄ PORT
PASSAGE A30
27"
30" CL.
4'-6"
HOSPITAL A15
PASSAGE A30
30" CL.
15"
"A" DECK


DET. 6-C
5
¼-20 T.H.M.S. 8" O.C.
A
ST. STEEL HINGES
6'-0½" TYPICAL
6
5'-3"
7'-0" CEILING HEIGHT EXCEPT DOOR NO. A16-1 NO CEILING
37"
13"
A

TYPICAL HINGED DOOR ELEVATION 4-A

SCALE: 1½" = 1'-0"


51'-0⅛" OFF ℄ STBD
3'-8"
DECK WC R10
30" CL.
15"
15"
4'-2¾"
DRY PROVISIONS STOREROOM R14
30" CL.
42'-3" OFF ℄ STBD
VEST R1
30" CL.
15"
47'-0" OFF ℄ PORT
VEST R2
30" CL.
42'-3" OFF ℄ PORT
CAMBER DECK

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH	OWNER DATE	OWNER APPD
0		SUBMITTED FOR APPROVAL			2-2-77	SHELL
A	8,9,10 8,9,10 1,6	1) FIXED LIGHT HEIGHT 28½ WAS 27½ REVISE OTHER DWG. TO AGREE 2) LINING CHANGED FROM ⅝ TO ⅞ IN WHEELHOUSE REVISE DIMS. OF SLIDING DOOR TO SUIT 3) GENERAL NOTE 10 AND DETAILS 6A & 6B REVISED GH 3/1/77 RE-SUBMITTED FOR APPROVAL	6-23-77	RLH	6-10-77	SHELL
B	ALL 4D 8B 8A,8D 10A	1) REV. TO MAKE DWG FOR 613/614 ONLY 2) REV. N.B. PLAN) 6'-0¹/₁₆ WAS 6'-1¹/₁₆" 20⁷/₁₆" WAS 19⁷/₁₆" 3) ELEV. (4-A) 8½" WAS ½" TO SUIT 613/614/615 4) REVISED GLIDE ROLLER. 5) REVISED SILL DEPTH. ER 8/6/77 — INITIAL ISSUE —				

AUTHORITY:

GENERAL NOTES:

1. DOORS & FRAMES TO BE STAINLESS STEEL CONTRUCTION, GAUGES AS SHOWN.
2. DOORS & FRAMES TO HAVE FACTORY APPLIED BAKED ON WHITE FINISH.
3. DOORS TO BE OF STIFFENED CONSTRUCTION.
4. HINGED DOORS TO BE EQUIPPED WITH CONC. IN HEAD CLOSER TYPE LCN 5015.
5. DOORS TO BE FURNISHED WITH HOLD OPEN HOOK.
6. TEMPLATE ALL WORK PRIOR TO ERECTION.
7. ALL FASTENERS SHALL BE 316 STAINLESS STEEL.
8. ALL MATERIALS FOR DOORS, FRAMES FLASHING ETC. SHALL BE STAINLESS STEEL GRADE 316.
9. LOCK CYLINDERS SHALL BE AS MANUF. BY FALCON LOCK CO. (FOR KEYING WITHIN SHIPS MASTER KEY SYSTEM) & AS PER REF. #.9.
10. HINGES & DOGS TO BE EQUIPPED WITH SELF-LUBRICATING NYLON SHOULDERED BUSHINGS.
11. LOCKING DOGS ARE SO DESIGNED THAT WHEN THE DOGS ARE UNLATCHED THEY ARE RETAINED IN OPEN POSITION BY AN INTEGRAL INTERNAL MECHANISM.
12. DOORS TO BE SOUND DEADENED & FILLED WITH 3½# DENSITY ROCKWOOL INSULATION.
13. SLIDING DOOR LATCHES TO BE HEAVY DUTY MARINE TYPE, BRONZE SATIN FINISH WITH LEVER ON BOTH SIDES OF DOOR. (# 19-65 LATCH) CYLINDER TO BE MOUNTED IN DOOR HEAD ON BOTH SIDES. (# 25 CYLINDER) SEE REF. # 9 FOR DESCRIPTION.

NO	REFERENCES	DWG NO
11	WINDOWS & WIPERS IN WHEELHOUSE	5400-52
10	MISC. JOINER HARDWARE	5300-550
9	LOCKS, CYLINDERS, KEYS & TAGS	5250-66
8	↑ SHT. 3	1270-643
7	SHT. 2	1270-642
6	DECK HOUSE ENCLOSURES SHT. 1	1270-641
5	↑ NAV. BRIDGE DECK	5200-67
4	"D" DECK	5200-65
3	"B" DECK	5200-63
2	"A" DECK	5200-62
1	JOINER ARRANGEMENT CAMBER DECK	5200-61

NNS & DD CO HULL NO	MARAD HULL NO	SHIPS NAME
614 613	310 309	

390,000 DWT. BULK OIL CARRIER
(U.L.C.C.)

APPROVALS
OWNERS SHELL LTR. 7376V. 2-2-77 G.K. Sumner
ABS N.A.
USPHS 11-26-76 S.R. Rivers
NEWPORT NEWS LTR 6136/H3830 6-23-77 R.L. Hennington
USCG 12-10-76 J.D. Villanueva

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV
FSCM NO 43689
DEPT

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

SCALE EXCEPT AS NOTED ¾" 1 FT
DRAWN ALV
CHECKED JC
SECT MGR J. F. Cogito
TECH APPROVAL
DATE COMPL. 11-15-76
EXAMINED
AUTHORIZED
DATE
CSD APPROVAL

EXTERIOR JOINER DOORS

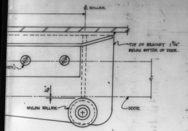
USMA DESIGN T11-5-116a
USMA DWG NO
HULL NO. 613,614
DWG NO. 5250-64
REV B
SHEET NO 1 OF 1

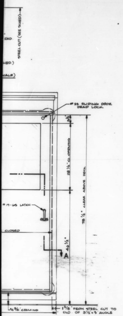
REPRODUCTION OFFICE
YARD PRINTS
REMARKS
DATE
ORDERED BY DESIGN
GROUP
MC NO

JR 159 & 160

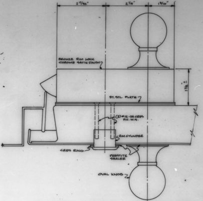
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
10X
FRAME 1

5250-64

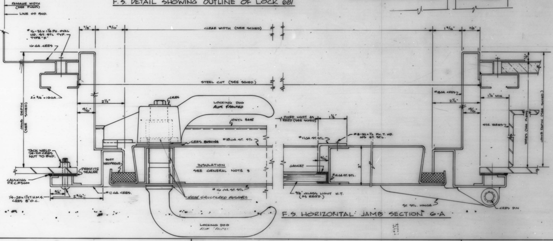

℄ ROLLER
TOP OF BRACKET 1 3/16" BELOW BOTTOM OF DOOR.
1/16"
NYLON ROLLER
DOOR


STEEL CUT (SEE SCHED)
RAD.
#25 SLIDING DOOR DEAD LOCK
2 1/8"
28 1/2" CL OPENING
78 1/2" CLEAR ABOVE DECK
#17-65 LATCH
CLOSED
46 1/2"
A
3/4" COAMING
1 5/8" FROM STEEL CUT TO END OF 3 1/2 x 3" ANGLE

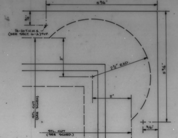
ELEVATION 8-A


2 7/32"
2 1/4"
1 9/16"
BRONZE RIM LOCK CHROME SATIN FINISH
1 7/8" ±
ST. STL. PLATE
(2) #12-24 CRES F.H. M.S.
RIM CYLINDER
CRES RING
PRESTITE SEALER
OVAL KNOB

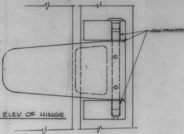
F.S. DETAIL SHOWING OUTLINE OF LOCK 681


PASSAGE WIDTH (SEE PLANS)
LINE OF BHD.
#16-32 x 1 1/4 PH. OVAL HD. ST. STL TYP. TYPE "F"
16 GA. CRES
7/8"
1 9/16"
CLEAR WIDTH (SEE SCHED)
STEEL CUT (SEE SCHED.)
2" x 3/4" x 16 GA.
JAMB DEPTH (SEE SCHED)
2 1/2"
13/16"
CRES
LOCKING DOG ALUM. & PAINTED
VINYL BASE
CRES BUSHING
#18 GA. ST. STL.
TACK WELD 1/4-20 CRES NUT TO BHD.
SOFT NEOPRENE
PRESTITE SEALER
INSULATION
SEE GENERAL NOTE 3
CAULKING P.R.C. #5000
#16 GA. ST. STL.
3/4"
2 3/4"
#12 GA. CRES.
1/4-20 x 1 1/2 T.H.M.S. CRES 8" O.C.
NYLON SHOULDERED BUSHINGS
LOCKING DOG ALUM. PAINTED
FIXED LIGHT AS REQ'D (SEE SCHED)
1 1/2"
#11 GA. ST. STL.
#8-32 x 1/2 PH. T. HD. MS ST. STL.
9/16"
GASKET
#14 GA. ST. STL.
2"
3/8" GLASS LIGHT H.T. (AS REQ'D)
ST. STL. HINGE
CRES PIN
#18 GA. CRES
2 1/2"
1 9/16"
7/8"
13/16"
1 1/4" MIN.
STIF. VARIES
VARIES (SEE PLANS)
JAMB DEPTH (SEE SCHED.)
1/2"

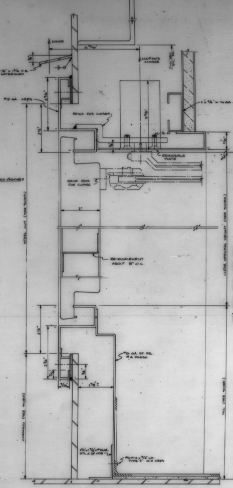
F.S. HORIZONTAL JAMB SECTION 6-A


5 3/4"
3/4"
1/4-20 T.H.M.S. (SEE SECT. 6-A) TYP.
2"
2 1/2" RAD.
5 3/4"
STL. CUT (SEE SCHED)
2"
STL. CUT (SEE SCHED.)
3/4"

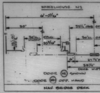
F.S. STEEL CUT DETAIL 6-C


NYLON SHOULDERED BUSHINGS

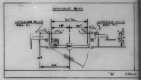
6B F.S. ELEV. OF HINGE

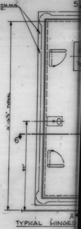

℄ HINGE
4 13/16"
3/8"
1/8" x 1 3/4 F.B. WATERSHED
℄ LCN #3013 CLOSER
7'-0" ABV. STL. DK.
#12 GA. CRES
2 3/4"
2 1/2"
REINF. FOR CLOSER
3 5/8"
2" x 3/4" x 16 GA.
1/4-20
3/8"
7/8"
3/16"
REMOVABLE PLATE
REINF. DOOR FOR CLOSER
2"
STEEL CUT (SEE SCHED)
REINFORCEMENT ABOUT 8" O.C.
CLEAR OPENING HEIGHT (SEE SCHED)
78 1/2" HEIGHT ABOVE STEEL DECK
2 1/2"
2 3/4"
7/16"
3/4"
9/16"
1 7/8" ±
#16 GA. ST. STL. #4 FINISH
COAMING (SEE SCHED)
SILL (SEE SCHED)
1 1/4" x 1 3/4" x #14 GA. STL. ∠ @ JOB
#6 F.H. x 3/4" LG. TYPE "F" 410 CRES

F.S. VERTICAL SECTION 5-A


WHEELHOUSE N2
6'-0 1/16"
30"
33 1/4" JAMB OPNG.
18"-0" OFF ℄
30" CL. WINDOW OPNG.
20 3/16"
30" CL. OPNG.
15"
6"
27 1/2" CL.
13/16"
38 1/2" DOOR WIDTH
DOOR N2 SHOWN
DOOR N1 OPP. HAND
NAV. BRIDGE DECK

STAIR TO
2 1/4"
17 3/16"
1 9/16"
"D"


PASSAGE B35
INTERIOR DOOR REF. D1
30" CL.
15"
15"
7 3/16"
1 9/16"
5 3/16"
2"
INTERIOR DOOR REF. D1
45'-6" OFF ℄ HULL
H7
24"
"B" DECK


1/4-20 T.H.M.S. 8" O.C.
5
6'-6 1/2" TYPICAL
6
37"
A

TYPICAL HINGED

SCALE: 1

MICRO-MASTER 105 mm

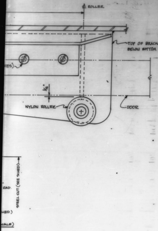
K+E ARLINGTON • WASHINGTON • BETHESDA • ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

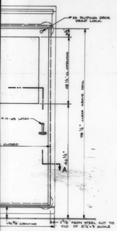
10X

FRAME 2

5250-64

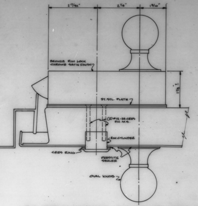


ROLLER
TOP OF BRACKET 1 3/16" BELOW BOTTOM OF DOOR.
NYLON ROLLER
DOOR
STEEL CUT (SEE SCHED)
RAD.



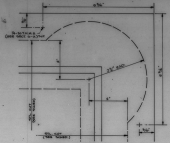
#33 SLIDING DOOR DEAD LOCK
28 1/2" CL OPENING
78 1/2" CLEAR ABOVE DECK
#19-68 LATCH
CLOSED
46 1/2"
A
COAMING

ELEVATION 8-A



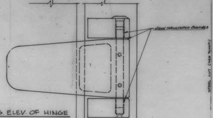
2 11/32"
2 1/4"
1 9/16"
BRONZE RIM LOCK CHROME SATIN FINISH
ST. STL. PLATE
(2) #12-24 CRES FH. M.S.
RIM CYLINDER
CRES RING
PRESTITE SEALER
OVAL KNOB
1 7/8"

F.S. DETAIL SHOWING OUTLINE OF LOCK 681



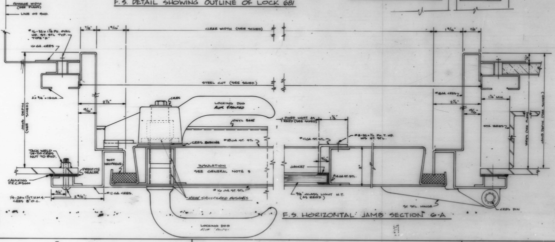
8 3/4"
1/4-20 T.H.M.S. (SEE SECT. 6-A) TYP.
2 3/4" RAD
5 3/4"
2"
STL. CUT (SEE SCHED)

F.S. STEEL CUT DETAIL 6-C



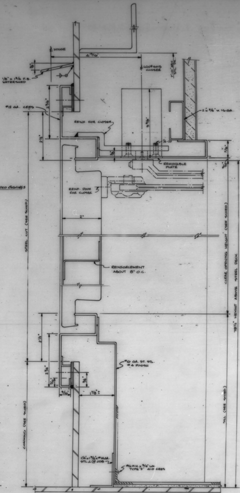
NYLON SHOULDERED BUSHINGS

68 F.S. ELEV. OF HINGE



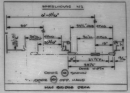
PASSAGE WIDTH (SEE PLANS)
LINE OF BHD.
#16-32 x 1 1/4 FH. OVAL HD. ST. STL. TYP. TYPE "F"
16 GA. CRES
7/8"
1 9/16"
CLEAR WIDTH (SEE SCHED)
STEEL CUT (SEE SCHED)
2 x 9/16 x 16 GA.
JAMB DEPTH (SEE SCHED)
2 1/2"
LOCKING DOG ALUM. & PAINTED
VINYL BASE
CRES BUSHING
#18 GA. ST. STL.
TACK WELD 1/4-20 CRES NUT TO BHD.
SOFT NEOPRENE
PRESTITE SEALER
CAULKING PRC #5000
INSULATION SEE GENERAL NOTE 5
#16 GA. ST. STL.
#12 GA. CRES
1/4-20 x 1"ST. H.M.S. CRES 8" O.C.
NYLON SHOULDERED BUSHINGS
LOCKING DOG
FIXED LIGHT AS REQ'D (SEE SCHED)
#11 GA. ST. STL.
#8-32 x 1/2 PH. T. HD. MS ST. STL.
GASKET
#14 GA. ST. STL.
3/8" GLASS LIGHT H.T. (AS REQ'D)
ST. STL. HINGE
CRES PIN
1 1/2" MIN.
JAMB DEPTH (SEE SCHED)
1 9/16"
7/8"

F.S. HORIZONTAL JAMB SECTION 6-A

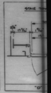


HINGE
1/8" x 1 3/4 F.B. WATERSHED
#12 GA. CRES
LCN 4010 CLOSER
2 x 9/16 x 16 GA.
REINF. FOR CLOSER
REMOVABLE PLATE
REINF. DOOR FOR CLOSER
2"
REINFORCEMENT ABOUT 8" O.C.
STEEL CUT (SEE SCHED)
CLEAR OPENING HEIGHT (SEE SCHED)
78 1/2" HEIGHT ABOVE STEEL DECK
#16 GA. ST. STL. #4 FINISH
COAMING (SEE SCHED)
SILL (SEE SCHED)
TYPE "F" 410 CRES

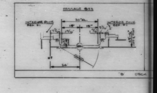
F.S. VERTICAL SECTION 5-A



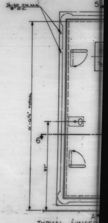
WHEELHOUSE N1
6'-0 1/4"
30"
20 1/16"
30 1/4" JAMB OPNG
21 1/2" CL
DOOR WIDTH
DOOR (N1) SHOWN
DOOR (N4) OPP. HAND
NAV. BRIDGE DECK



STAIR
17 1/2"
"D"



PASSAGE N1
INTERIOR DOOR
30" CL
24"



1/4-20 T.H.M.S. 8" O.C.
6'-6 1/2" TYPICAL
6"
37"
A

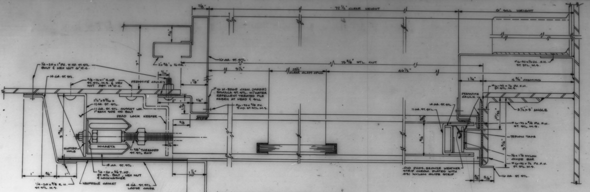
TYPICAL HINGED

5250-64

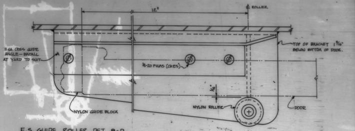
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
10X
FRAME 2

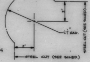
10 | 9 | 8


7/8"
72 1/2" CLEAR HEIGHT
6" SILL HEIGHT
7/8"
7"
2 x 3/4" x 16 GA.
16 GA. ST. STL.
1/4-20 x 1" PH. T. HD. ST. STL. BOLT & HEX NUT 6" O.C.
14 GA. ST. STL.
3/8-16 x 1" R. HD. ST. STL. M.S. & HEX NUT ABT. 14" O.C.
PRESSTITE CAULK
7/16"
1 7/8"
3 1/2"
28 1/2" CLEAR GLASS OPNG.
75 5/8" STL. CUT
46 1/2"
#16 M-EDGE CHAN. (MODIF.) SOMACA ST. STL. W/ WATER REPELLENT TREATED PILE FABRIC AT HEAD & SILL
2"
7/8"
#6-32 x 3/8 PH. T. HD. ST. STL. M.S.
1 1/2" x 3 5/16 x 11 GA. ST. STL.
11 GA. ST. STL. GUSSET LOC. 1" EACH SIDE OF BOLT
DEAD LOCK KEEPER
3 17/32"
SLOTTED HOLE
MICARTA
3/8" THREADED ST. STL ROD
18 GA. ST. STL.
1/4-20 x 3/4 T. HD. ST. STL. BOLT, HEX NUT & LOCKWASHER
1"
3/4"
1"
1/4-20 x 3/8 R. H. ST. STL. M.S.
NEOPRENE GASKET
14 GA. ST. STL. LOOSE COVER
1 1/2"
PLUG AFT END ONLY
#6-32 x 1/2 U.C. F.H. ST. STL. M.S.
1 1/4"
4 3/4" COAMING
#6-32 x 1/2 PH. F.H. ST. STL. M.S.
PRESSTITE CAULK
14 GA. ST. STL.
11 GA. ST. STL.
3 1/2 x 3" ANGLE
1 27/32"
#6-32 x 3/4 PH. F.H. ST. STL. M.S.
TEFLON TAPE
1/4 x 1 1/4 NYLON GUIDE BAR
#6-32 x 1/2 PH. F.H. ST. STL. M.S.
3 3/4"
.010 PHOS. BRONZE WEATHER STRIP CHROM. PLATED WITH .031 NYLON GLIDE STRIP
3/8"
5/8"
16 GA. ST. STL.

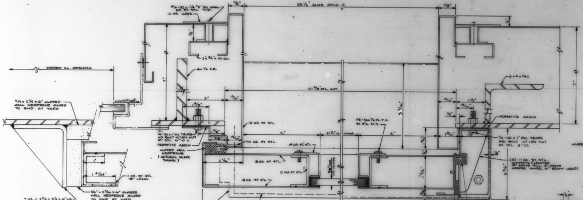
F.S. VERTICAL JAMB SECTION 9-C


12"
℄ ROLLER
11 GA. CRES GUIDE ANGLE – INSTALL AT YARD TO SUIT
1/4-20 FHMS (CRES)
TOP OF BRACKET 1 3/16" BELOW BOTTOM OF DOOR.
1/16"
NYLON GUIDE BLOCK
NYLON ROLLER
DOOR

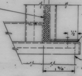
F.S. GUIDE ROLLER DET. 8-D


2"
2 1/2" RAD.
2"
STEEL CUT (SEE SCHED.)
STEEL CUT (SEE SCHED.)

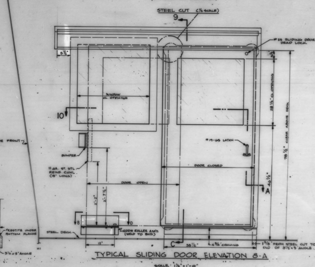
STEEL CUT (1/2 SCALE)


#6-32 x 1 1/4 "F" PH. OVAL HD. ST. STL. TYP.
16 GA. CRES
7/8"
35 1/2" JAMB OPNG.
7/8"
2 x 3/4" x 16 GA.
WINDOW CL. OPENING
4 x 1/2 F.B.
7"
2"
13/16"
1 3/8"
37 5/8" STL. CUT
3/4 x 2 1/4 x 6" CLOSED CELL NEOPRENE GLUED TO BHD. AT YARD
1/4"-20 x 1" PH. TRUSS HD. BOLT W/ HEX NUT ST. STL. 6" O.C.
PRESSTITE CAULK
CLOSED CELL NEOPRENE (NATURAL SHAPE SHOWN)
16 GA. ST. STL.
16 GA. ST. STL.
4"
27 1/2" CL. OPNG.
4"
2 1/16"
14 GA. ST. STL.
18 GA. ST. STL.
12 GA. ST. STL.
3/8" THK. H.T. GLASS
18 GA. ST. STL.
#8-32 x 1/2 PH. T. H. ST. STL. M.S.
3 7/16"
1"
1 41/64"
11 GA. ST. STL. 18" LONG
7 GA. x 2 3/4 x 3 1/4 x 6" LG. MILD STL. STOP W/ FLANGES TOP & BOTTOM
3/4" x 2 7/16 x 6" CLOSED CELL NEOPRENE GLUED TO STOP AT YARD
ST. STL. SILL
3 1/2 x 3"
4 x 3 x 1/4 L
1 1/2"
1/4"
PRESSTITE CAULK
1 3/16"
1/4-20 x 1" PH. TRUSS HD. BOLT W/ HEX NUT ST. STL. 6" OC
1/8"
(3) 11 GA. ST. STL. GUSSETS (LOCATED 18" ABOVE SILL, 3" ABOVE KEEPER COVER, 6" BELOW HEAD)
7"
3 3/4"
1 3/4"
CLOSED CELL NEOPRENE
9
A
38 1/2" DOOR WIDTH

F.S. HORIZONTAL JAMB SECTION 10-A


1/4"
1/2"
PRESTITE UNDER BOTTOM FLANGE
3 1/2 x 3" ANGLE
1 3/8"

SILL DETAIL 9-A


HOUSE TOP
WHEELHOUSE FRONT
9
#25 SLIDING DOOR DEAD LOCK
5 1/2"
WINDOW CL. OPENING
10
28 1/2" CL. OPENING
78 1/2" CLEAR ABOVE DECK
#19-65 LATCH
BUMPER
11 GA. ST. STL. REINF. CHNL (18" LONG)
DOOR CLOSED
DOOR OPEN
46 1/2"
A
2'-2"
2'-7 1/2"
B
D
GUIDE ROLLER ASSY. (WELD TO BHD.)
STEEL DECK
12"
C
38 1/2"
4 3/4" COAMING
1 5/8" FROM STEEL CUT TO END OF 3 1/2 x 3 ANGLE

TYPICAL SLIDING DOOR ELEVATION 8-A

SCALE: 1 1/2" = 1'-0"

10 | 9 | 8

5250-64

MICRO-MASTER 105 mm

K+E

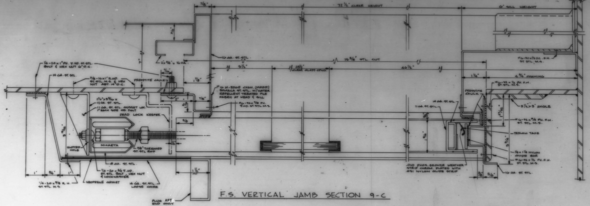
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

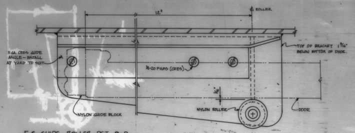
10X

FRAME 3

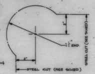
10 9 8


7/8"
72 ½" CLEAR HEIGHT
6" SILL HEIGHT
7/8"
7"
16 GA. ST. STL.
2 x ¾" x 16 GA.
5½"
28½" CLEAR GLASS OPNG.
75 5/8" STL. CUT
46½"
¼-20 x 1" PH. T. HD. ST. STL. BOLT & HEX NUT 6" O.C.
14 GA. ST. STL.
3/8-16 x 1" R. HD. ST. STL. M.S. & HEX NUT ABT. 14" O.C.
7/16"
PRESSTITE CAULK
1 7/8"
#16 M-EDGE CHAN. (MODIF.) SOMACA ST. STL. W/ WATER REPELLENT TREATED PILE FABRIC AT HEAD & SILL
7/8"
2"
1 ½" x 3 5/16" x 11 GA. ST. STL.
11 GA. ST. STL. GUSSET LOC. 1" EACH SIDE OF BOLT
#6-32 x 3/8 PH. T. HD. ST. STL. M.S.
DEAD LOCK KEEPER
3/8
3 7/32
SLOTTED HOLE
MICARTA
3/8" THREADED ST. STL. ROD
18 GA. ST. STL.
¼-20 x ¾ T. HD. ST. STL. BOLT, HEX NUT & LOCKWASHER
NEOPRENE GASKET
14 GA. ST. STL. LOOSE COVER
1"
¾"
1"
¼-20 x 3/8 R.H. ST. STL. M.S.
1 ½"
PLUG AFT END ONLY
#6-32 x ½ 100° F.H. ST. STL. M.S.
1 ¼"
4 ¾" COAMING
#6-32 x ½ PH. F.H. ST. STL. M.S.
PRESSTITE CAULK
14 GA. ST. STL.
11 GA. ST. STL.
3 ½ x 3" ANGLE
1 27/32"
#6-32 x ¾ PH. F.H. ST. STL. M.S.
TEFLON TAPE
¼ x 1 ¼ NYLON GUIDE BAR
#6-32 x ½ PH. F.H. ST. STL. M.S.
.010 PHOS. BRONZE WEATHER STRIP CHROM. PLATED WITH .031 NYLON GLIDE STRIP
16 GA. ST. STL.
3/8
5/8"
3 ¾"

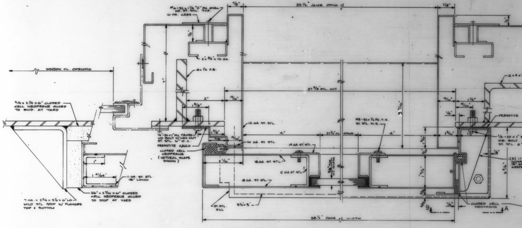
F.S. VERTICAL JAMB SECTION 9-C


℄ ROLLER
12"
11 GA. CRES GUIDE ANGLE—INSTALL AT YARD TO SUIT
¼-20 FHMS (CRES)
TOP OF BRACKET 1 3/16" BELOW BOTTOM OF DOOR.
1/16"
NYLON GUIDE BLOCK
NYLON ROLLER
DOOR

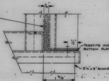
F.S. GUIDE ROLLER DET. 8-D


2"
2 ¼" RAD.
2"
STEEL CUT (SEE SCHED.)
STEEL CUT (SEE SCHED.)

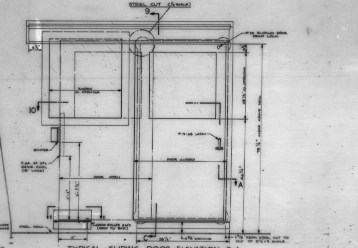
STEEL CUT (½ SCALE)


#6-32 x 1 ¼ "F" PH. OVAL HD. ST. STL. TYP.
16 GA. CRES
7/8"
35 ½" JAMB OPNG.
7/8"
½"
7/8"
2 x ¾" x 16 GA.
4 x ½ F.B.
WINDOW CL. OPENING
7"
37 5/8" STL. CUT
4 x 3 x ¼ L
7"
3/4 x 2 ¼ x 6" CLOSED CELL NEOPRENE GLUED TO BHD. AT YARD
2"
13/16"
1 3/8"
3 7/16"
13/16"
1 ½"
5/16"
¼"
PRESSTITE CAULK
16 GA. ST. STL.
¼-20 x 1" PH. TRUSS HD. BOLT W/ HEX NUT ST. STL. 6" O.C.
1 3/8"
7/8"
13/16"
16 GA. ST. STL.
4"
27 ½" CL. OPNG.
4"
#8-32 x ½ PH. T.H. ST. STL. M.S.
1 3/16"
¼-20 x 1" PH. TRUSS HD. BOLT W/ HEX NUT ST. STL. 6" OC
PRESSTITE CAULK
CLOSED CELL NEOPRENE (NATURAL SHAPE SHOWN)
14 GA. ST. STL.
2 1/16"
18 GA. ST. STL.
12 GA. ST. STL.
3/8" THK. H.T. GLASS
1/8"
(3) 11 GA. ST. STL. GUSSETS (LOCATED 18" ABOVE SILL, 3" ABOVE KEEPER COVER, 6" BELOW HEAD)
1 ¾"
3 ¾"
1"
1 41/64"
11 GA. ST. STL. 18" LONG
18 GA. ST. STL.
7 GA. x 2 ¾ x 3 ¼ x 6" LG. MILD STL. STOP W/ FLANGES TOP & BOTTOM
3/16" x 2 7/16 x 6" CLOSED CELL NEOPRENE GLUED TO STOP AT YARD
ST. STL. SILL
3 ½ x 3" L
9
A
¼"
CLOSED CELL NEOPRENE
38 ½" DOOR WIDTH

F.S. HORIZONTAL JAMB SECTION 10-A


¼"
½"
PRESTITE UNDER BOTTOM FLANGE
3 ½ x 3" ANGLE
1 5/8"

SILL DETAIL 9-A


HOUSE TOP
WHEELHOUSE FRONT
9
5 ½"
#25 SLIDING DOOR DEAD LOCK
WINDOW CL. OPENING
28 ½" CL. OPENING
78 ½" CLEAR ABOVE DECK
10
#19-65 LATCH
BUMPER
11 GA. ST. STL. REINF. CHNL. (18" LONG)
DOOR CLOSED
DOOR OPEN
2'-2"
2'-7 ½"
46 ½"
A
B
D
STEEL DECK
GUIDE ROLLER ASSY. (WELD TO BHD.)
12"
C
38 ½"
4 ¾" COAMING
1 5/8" FROM STEEL CUT TO END OF 3 ½ x 3 ANGLE

TYPICAL SLIDING DOOR ELEVATION 8-A

SCALE: 1½" = 1'-0"

10 9 8

5250-64

MICRO-MASTER 105 mm

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ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 3

10X

HF41

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD CO DATE	NNS & DD CO AUTH'D	OWNER DATE	OWNER APP'D
O	ALL	SUBMITTAL FOR APPROVAL	11-4-77	R.L.H.	8-24-77 8-22-77	SHELL ZAPATA
A	ALL	INITIAL ISSUE				
	4	1) ADDED DOOR 60-10, HULL 615 ONLY. 7-18-77 jkl				
	10	2) ADDED HOLDBACKS AT CATWALK ACCESS & ELEVATOR MACH'Y. ACCESS DOORS 8-3-77 EG.				
B	3,4	1) CHANGED HOOK & BUMPER TYPE FOR DOORS N1, N3, D9, D12, D12-1, D14, D15, C8, C15, C16, C1, B4, B11, B16, A1, A10, R1, R2, R4, R11, R13, R14, R14-2, R16-1, R18, R21, R21-1, R24, R24-1, R25, R25-1, R26, R26-1, R29, R30.				
	5	2) ADDED TOTAL QTY'S FOR ALL HOOKS & BUMPERS.				
	5	3) REVISED BUMPER TYPE #3.				
	5	4) SPECIFIED HOOK LENGTHS FOR TYPES #1 & #4.				
	4	5) ADDED HOOK & BUMPER TO DOORS A16 & R17. 10-21-77 jkl				
	14	6) REV. 5'-8" DIM. TO 5'-4" 12-12-77 GW				
	4,5	7) ADDED H&B TO DOORS D7-1 & D23-1 3/2/78 EG				
	7	8) ADDED CLOSER TO DOOR D9 3/28/78 EG				

REV. STATUS OF SHEETS

REV	B	O	B	B	B	O	O	O	O	A	O	O	O	B	O	O
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

GROUP

MC NO

DWG REV. - HULL APPLIC

REV	613	614	615
O	YES	YES	YES
A	YES	YES	YES
B	YES	YES	YES

NNS & DDCO HULL NO	MARAD HULL NO	USMA DESIGN	SHIP'S NAME
615	311		
614	310		
613	309	T11-S-116A	

390,000 DWT BULK OIL CARRIER
(ULCC)
DECK HOUSE

APPROVALS

OWNERS: SHELL LTR 177OV, 8-24-77 C.E. PURCELL
ZAPATA LTR 8-22-77 J.C. PURVIS
ABS: N.R.

NEWPORT NEWS
LTR 613C/H5300, 11-4-77, RL HARRINGTON
USCG: N.R. | USPH 6/29/77 S.R.Ramirez

Newport News Shipbuilding

Commercial Ship Division

DESIGN DIVISION DEPT. HULL FITTINGS

HOPEMAN BROTHERS INC
NEW YORK, N.Y.

SCALE: AS NOTED
DATE COMPL: 6-20-77
DRAWN: JKLee 4-27-77
EXAMINED:
CHECKED: EPG
AUTHORIZED:
SECT. MGR: J. T. Cogut
DATE:
TECH APPROVAL:
USCG APPROVAL:

TITLE

MISC. JOINER HARDWARE

DWG NO: 5300-550
REVISION: B
SHEET NO. 1 OF 16

REFERENCE PLANS

NO.	TITLE	DWG. NO.
1	EXTERIOR JOINER DOORS	5250-64/5250-79
2	INTERIOR JOINER DOORS	5250-65
3	JOINER ARRANGEMENT CAMBER DK	5200-61/5200-90
4	JOINER ARRANGEMENT "A" DK	5200-62
5	JOINER ARRANGEMENT "B" DK	5200-63
6	JOINER ARRANGEMENT "C" DK	5200-64
7	JOINER ARRANGEMENT "D" DK	5200-65
8	JOINER ARRANGEMENT NAV. BRIDGE DK	5200-67/5200-91

5300-550

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
Registered trademark of KEUFFEL & ESSER CO

SEPT. '80

6X

INDEX

SHT. №	TITLE
1	TITLE SHEET, REFERENCES & REVISIONS
2	INDEX SHEET
3	HOOKS & BUMPERS SCHEDULE - FF 354 SHT. 1 OF 3
4	HOOKS & BUMPERS SCHEDULE - FF 354 SHT. 2 OF 3
5	HOOKS & BUMPERS DETAILS - FF 354 SHT. 3 OF 3
6	DOOR CLOSER SCHEDULE - FF 352 SHT. 1 OF 3
7	DOOR CLOSER SCHEDULE - FF 352 SHT. 2 OF 3
8	DOOR CLOSER SCHEDULE - FF 352 SHT. 3 OF 3
9	LCN CONCEALED DOOR CLOSER TYP. INSTALLATION - FF 352-1
10	HOLD-BACK HOOKS FOR EXTERIOR DOORS - FF 355-1
11	COAT & HAT HOOKS SCHEDULE - FF 353 SHT. 1 OF 2
12	COAT & HAT HOOKS DETAILS - FF 353 SHT. 2 OF 2
13	WARDROBE SHELF SCHEDULE - FF 161-1 SHT. 1 OF 2
14	WARDROBE SHELF DETAILS - FF 161-1 SHT. 2 OF 2
15	TIE RACK - FF 364-1
16	SHOE RACK - FF 363

DRAWN BY jkl DATE 4-27-77 SCALE	TITLE MISC. JOINER HARDWARE - INDEX	HULLS 613,614,615	SHIPYARD NEWPORT NEWS	H.B. DWG No 5300-550	SHEET 2 OF 16	○

5300-550

SEPT. '80

6X

DOOR No	HOOK DESCRIPTION	DOOR No	HOOK DESCRIPTION	DOOR No	HOOK DESCRIPTION	DOOR No	HOOK DESCRIPTION
△B1 N 1	Hook & Bumper Type #1	D 24-W	See Ref. 2	△B1 C 16	Hook & Bumper Type #1	△B1 B 11	Bumper Type #2
△B1 N 3	Hook & Bumper Type #3 & 4	D 24-W-1	↓	C 19	Hook & Bumper Type #1	B 12	Hook & Bumper Type #3 & 4
D 1	Hook & Bumper Type #1	D 25	Hook & Bumper Type #1	C 20	↓	B 12-W	See Ref. 2
D 2	↓	D 26-1	↓	C 20-W	See Ref. 2	B 13	Hook & Bumper Type #1
D 2W	See Ref. 2	D 27	↓	C 21	↓	B 14	↓
D 3	Hook & Bumper Type #1	D 28	↓	C 22	Hook & Bumper Type #1	B 15	Hook & Bumper Type #3 & 4
D 3-1	See Ref. 2	D 28W	See Ref. 2	C 23	↓	B 15-W	See Ref. 2
D 4-1	Hook & Bumper Type #1	D 29	Hook & Bumper Type #1	C 23-W	See Ref. 2	△B1 B 16	Hook & Bumper Type #1
D 5	↓	D 22	See Ref. 2	C 23-W-1	↓	B 17	Hook & Bumper Type #1
D 6	↓	D 15-1	Hook & Bumper Type #1	C 24	Hook & Bumper Type #1	B 18	Hook & Bumper Type #3 & 4
D 6-W	See Ref. 2	C 2	Hook & Bumper Type #1	C 25	↓	B 18-W	See Ref. 2
D6-W-1	↓	C 2-W	See Ref. 2	C 26	↓	B 21	Hook & Bumper Type #1
D 7	Hook & Bumper Type #1	C 3	Hook & Bumper Type #1	C 27	↓	B 22	↓
△B1 D 9	Bumper Type #2	C 4	↓	C 27-W	See Ref. 2	B 23	Hook & Bumper Type #3 & 4
D 10	Hook & Bumper Type #1	C 5	↓	△B1 C 1	Hook & Bumper Type #1	B 23-W	See Ref. 2
D 11	↓	C 6	↓			B 24	↓
D 11-W	See Ref. 2	C 6-W	See Ref. 2	B 1	Hook & Bumper Type #1	B 25	Hook & Bumper Type #1
△B1 D 12	Bumper Type #2	C 6-W-1	↓	B 2	↓	B 25W	See Ref. 2
△B1 D 12-1	↓	C 7	Hook & Bumper Type #1	B 3	Hook & Bumper Type #3 & 4	B 26	Hook & Bumper Type #1
D 13	Bumper Type #2	△B1 C 8	Bumper Type #2	B 3-W	See Ref. 2	B 27	↓
△B1 D 14	Bumper Type #2	C 9	Hook & Bumper Type #1	△B1 B 4	Bumper Type #2	B 28	Hook & Bumper Type #3 & 4
△B1 D 15	↓	C 9-W	See Ref. 2	B 5	Hook & Bumper Type #3 & 4	B 28-W	See Ref. 2
D 16	Hook & Bumper Type #1	C 10	Hook & Bumper Type #1	B 5-W	See Ref. 2	B 29	Hook & Bumper Type #1
D 17	↓	C 11	↓	B 6	Hook & Bumper Type #1	B 30	↓
D 17-W	See Ref. 2	C 12	↓	B 7	↓	B 31	Hook & Bumper Type #3 & 4
D 20	Hook & Bumper Type #1	C 12-W	See Ref. 2	B 8	Hook & Bumper Type #3 & 4	B 31-W	See Ref. 2
D 21	↓	C 13	Hook & Bumper Type #1	B 8-W	See Ref. 2	B 32	Hook & Bumper Type #3 & 4
D 21-W	See Ref. 2	C 13-W	See Ref. 2	B 9	Hook & Bumper Type #1	B 32-W	See Ref. 2
D 23	Hook & Bumper Type #1	C 14	Hook & Bumper Type #1	B 10	↓		
D 24	↓	△B1 C 15	Bumper Type #2	B 10-W	See Ref. 2		

REVISIONS

No.	DESCRIPTION	APPROVED DATE	APPROVED BY
B-1	CHANGED HOOK & BUMPER TYPE FOR DOORS N1, N3, D9, D12, D12-1, D14, D15, C8, C15, C16, C1, B4, B11 & B16.	10-21-77	jkl

GENERAL NOTES

No.	
1.	MATERIAL ______
2.	FINISH ______
3.	COLOR ______
4.	TOP ______
5.	FOR HOOKS & BUMPERS DETAILS SEE FF 354 SHT 3 OF 3
6.	FINAL LOCATIONS FOR HOOKS & BUMPERS SHALL BE DETERMINED ON JOB TO SUIT CONDITIONS.

No.	TITLE	Sht.	H.B.	S.Y. No.

REFERENCES

HULL/S 613-614-615

SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE: MISC. JOINER HARDWARE
HOOKS & BUMPERS SCHED.

F.F. No. 354 SHT. 1 OF 3

SHIPYARD No. ______
MARAD No. ______
H.B. No. 5300-550 SHT 3 OF 16

REV. B

DISTRIB.	S	P
W	1	
JOB		5
ROCH.		
P.O.		
FILE		1
CONT.		1
HB/NN		1

MILL W
STD. No. ______
DRAWN BY jkl DATE 4-27-77
SCALE: ______

FASTENER-LINING ______ QUANTITY PER ITEM
FASTENER-DIVISIONAL ______ QUANTITY PER ITEM
FASTENER-STEEL ______ QUANTITY PER ITEM

RELEASED 10-4-77
QUANTITY GIVEN FOR ONE SHIP FURNISH FOR 3 SHIP/S.

5300-550

SEPT. '80

6X

DOOR Nº	HOOK DESCRIPTION	DOOR Nº	HOOK DESCRIPTION	DOOR Nº	HOOK DESCRIPTION	DOOR Nº	HOOK DESCRIPTION
△B A 1	Hook & Bumper Type #3 & 4	A 23	Hook & Bumper Type #1	②R 17-1	Hook & Bumpers Type #1 & 3	*①2-1	Hook & Bumper Type #1
A 2	Hook & Bumper Type #3 & 4	A 23-W	See Ref 2 △B	R 18	Bumper Type #2	*②2-2	↓
A 2-W	See Ref. 2	A 24	Hook & Bumper Type #1 △B	R 21	Hook & Bumper Type #1	*78-2	
A 3	Hook & Bumper Type #1	A 25	↓ △B	R 21-1	Bumper Type #2	*78-3	
A 4	↓	A 26	Hook & Bumper Type #3 & 4	R 22	Hook & Bumper Type #1	*60-1	
A 5	Hook & Bumper Type #3 & 4	A 26-W	See Ref. 2	R 23	See Ref 2	*①60-2	Bumper Type #3
A 5-W	See Ref. 2	A 27	Hook & Bumper Type #1 △B	①R 24	Bumper Type #2	*①60-3	↓
A 6	Hook & Bumper Type #1	A 28	↓ △B	①R 24-1	↓	*①60-4	
A 7	↓	A 29	Hook & Bumper Type #3 & 4 △B	②R 25	Hook & Bumper Type #1	*②60-5	
A 7-W	See Ref. 2	A 29-W	See Ref. 2 △B	①R 25-1	Bumper Type #2	*②60-6	
A 7-W-1	↓ △B	A 16	Bumper Type #2 △B	R 26	↓	*②60-7	
A 8	Hook & Bumper Type #1		△B	R 26-1		*②60-8	
A 8-W	See Ref. 2 △B	R 1	Bumper Type #2	R 27	Hook & Bumpers Type #1 & 3	*②60-9	(2) Hooks & Bumpers Type #1
A 8-W-1	↓ △B	R 2	↓	R 28	Bumper Type #2	*②60-10	Hook & Bumper Type #1 △A
A 9	Hook & Bumper Type #1	R 3	Bumper Type #2 △B	R 29	Bumper Type #2		
△B A 10	Bumper Type #2 △B	R 4	Bumper Type #2 △B	R 30	↓		
A 11	Hook & Bumper Type #1	R 5	Hook & Bumper Type #1 △B	R 17	Hook & Bumper Type #1		
A 11-W	See Ref. 2	R 6	↓				
A 11-W-1	↓	R 7	Bumper Type #2	①D7-1	Hook & Bumper Type #1		
A 12	Hook & Bumper Type #1 △B	R 11	Bumper Type #2	①D23-1	↓		
A 13	↓	R 12	Hook & Bumper Type #1				
A 14	△B	R 13	Bumper Type #2				
A 15	↓ △B	①R 14	↓				
A 15-W	See Ref. 2 △B	②R 14-2					
A 18	Hook & Bumper Type #1	①R 15	Hook & Bumper Type #3 & 4				
A 19	↓	①R 15-1	Bumper Type #2				
A 20	See Ref. 2	②R 15-2	↓				
A 21	Hook & Bumper Type #1	②R 15-3	Hook & Bumper Type #1				
A 21-W	See Ref. 2	①R 16	Bumper Type #2				
A 22	Hook & Bumper Type #1 △B	①R 16-1	Bumper Type #2				

①HULLS 613 & 614 ONLY.
②HULL 615 ONLY.

*SHIP TO HB-NN.

REVISIONS

No.	DESCRIPTION	APPROVED DATE	APPROVED BY
A-1	ADDED DOOR 60-10.	7-18-77	jhl
B-1	CHANGED HOOK & BUMPER TYPE FOR DOORS A1, A10, R1, R2, R4, R11, R13, R14, R14-2, R16-1, R18, R21, R21-1, R24, R24-1, R25, R25-1, R26, R26-1, R29, R30.		
B-5	ADDED HOOK & BUMPER TO DOORS A16 & R17.	10-21-77	jhl
B7	ADDED H&B TO DOORS D7-1 & D23-1	3/2/78	EG

GENERAL NOTES

No.	
1.	MATERIAL ______
2.	FINISH ______
3.	COLOR ______
4.	TOP ______
5.	FOR HOOKS & BUMPERS DETAILS SEE FF 354 SHT 3 OF 3
6.	FINAL LOCATIONS FOR HOOKS & BUMPERS SHALL BE DETERMINED ON JOB TO SUIT CONDITIONS.

No.	TITLE	Sht.	H.B.	S.Y. No.

REFERENCES

HULL/S 613-614-615

SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE: MISC. JOINER HARDWARE
HOOKS & BUMPERS SCHED.

F.F. No. 354 SHT. 2 OF 3

SHIPYARD No. ______
MARAD No. ______
H.B. No. 5300-550 SHT 4 OF 16

REV. B

DISTRIB.	S	P
W	1	
JOB		6
ROCH.		
P.O.		
FILE		1
CONT.		1
HBNN		1

MILL W

STD. No. ______

DRAWN BY jhl DATE 4-27-77
SCALE: ______

FASTENER-LINING	FASTENER-DIVISIONAL	FASTENER-STEEL
QUANTITY PER ITEM	QUANTITY PER ITEM	QUANTITY PER ITEM

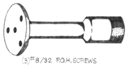
RELEASED 10-4-77

QUANTITY GIVEN FOR ONE SHIP
FURNISH FOR 3 SHIP/S.

5300-550

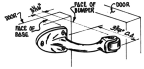
SEPT. '80

6X


(3)#8/32 P.O.H. SCREWS

BUMPER WITHOUT HOOK

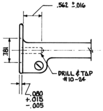
TYPE # 2 WHITE BRONZE US 25D
SIMILAR TO GETTY # 3150
FURNISH WITH #10-24 THREADED STUDS

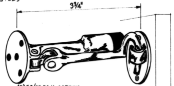


CURVED ROLLER BUMPER

△B2 QUANTITIES

TYPE	SHIP TO	613	614	615
#1 W/1¼" STUD	CART	60	60	60
#1 W/2" STUD	CART	30	30	31
#1 WITHOUT STUD	N.N.	4	4	7
#2 W/1¼" STUD	CART	6	6	5
#2 W/2" STUD	CART	26	26	24
#3	N.N.	3	3	4
#3	CART	18	18	18
#4	CART	17	17	16





(5)#8/32 P.O.H. SCREWS

COMBINATION HOOK & BUMPER

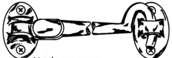
TYPE # 1 WHITE BRONZE US 25D
FURNISH WITH #10-24 THREADED STUDS
1¼" LONG FOR DIVISIONAL BHD.
2" LONG FOR LINING BHD.
△B4 HOOK LENGTH = 4"

△B3

RECESS & HOLE FOR #8 R.H. SCREW

BUMPER

TYPE # 3
WHITE RUBBER
△B3 WMC Stock #673202


(4) #8/32 P.O.H. SCREWS

CABIN DOOR HOOK

TYPE #4 WHITE BRONZE US 25D
△B4 HOOK LENGTH = 4"

REVISIONS

No.	DESCRIPTION	APPROVED DATE	APPROVED BY
B-2	ADDED TOTAL QTY'S FOR ALL.		
B-3	REVISED BUMPER TYPE #3.		
B-4	SPECIFIED HOOK LENGTHS.	10-21-77	jhl
B-7	ADDED H&B FOR D7-1 & D23-1.	3-9-78	jhl

GENERAL NOTES

No.	GENERAL NOTES
1.	MATERIAL WHITE BRONZE
2.	FINISH U.S. 25 D
3.	COLOR
4.	TOP
5.	FOR HOOK & BUMPER SCHEDULE SEE FF 354 SHTS 1 & 2 of 3

No.	TITLE	Sht.	H.B.	S.Y. No.

REFERENCES

HULL/S 613-614-615
SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE: MISCELLANEOUS JOINER HARDWARE HOOKS & BUMPERS
F.F. No. 354 SHT. 3 of 3

DISTRIB.	S	P
W	1	
JOB		6
ROCH.		
P.O.		
FILE		1
CONT.		1
HBNN		1

MILL W
STD. No.
DRAWN BY M.R.F./jhl DATE 11-15-73
SCALE:

FASTENER-LINING	FASTENER-DIVISIONAL	FASTENER-STEEL
QUANTITY PER ITEM	QUANTITY PER ITEM	QUANTITY PER ITEM

RELEASED 10-4-77
QUANTITY ~~GIVEN FOR ONE SHIP~~
~~FURNISH FOR~~ 3 SHIP/S △B2
AS NOTED.

SHIPYARD No.
MARAD No.
H.B. No. 5300-550 SHT 5 OF 16
REV. B

5300-550

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

6X

CLOSER SCHEDULE

DECK	DOOR Nº	SWING	DOOR TYPE	DOOR WIDTH	DEGREE SWING	CLOSER TYPE	CLOSER SIZE	REMARKS
BRIDGE	N 1	RH	1 3/8 STL. INT.	26"	90°	LCN SURF		
"D" ↓	D 4	RH	1 3/8 STL. INT.	26"	90°	LCN SURF		
	D 9-1	RHR	2" ST. STL. EXT.	30"	180°	LCN 5015		
	D 14	RH	1 3/8 STL. INT.	30"	90°	LCN SURF		
	D 22	LH	1 3/8 STL. INT.	30"	90°	LCN SURF		
	D 26	LH	1 3/8 STL. INT.	26"	90°	LCN SURF		
B8	D 9	RH	1 3/8 STL. INT.	30"	90°	LCN SURF		
"C" ↓	C 1	RH	1 3/8 STL. INT.	30"	180°	LCN SURF		PARALLEL ARM
	C 8	RH	1 3/8 STL. INT.	30"	90°	LCN SURF		
	C 16	RH	1 3/8 STL. INT.	30"	90°	LCN SURF		
	C 21	LH	1 3/8 STL. INT.	30"	90°	LCN SURF		
"B" ↓	B 11	LH	1 3/8 ST. STL. INT.	30"	90°	LCN SURF		
	B 16	LH	1 3/8 STL. INT.	30"	90°	LCN SURF		
	B 24	RH	1 3/8 ST. STL. INT.	30"	90°	LCN SURF		
	B 33	RHR	2" ST. STL. EXT.	30"	90°	LCN 5015		
	B 33-1	LHR	2" ST. STL. EXT.	30"	90°	LCN 5015		
"A" ↓	A 10	LH	1 3/8 STL. INT.	30"	90°	LCN SURF		
	A 15-1	RHR	2" ST. STL. EXT.	30"	90°	LCN 5015		WITH HOLD-OPEN
	A 16	RH	1 3/8 STL. INT.	30"	140°	LCN SURF		
	A 16-1	LHR	2" ST. STL. EXT.	30"	140°	LCN 5015		
	A 20	RH	1 3/8 STL. INT.	30"	90°	LCN SURF		

REVISIONS

No.	DESCRIPTION	APPROVED DATE	APPROVED BY
B8	ADDED CLOSER TO D9	3-29-78	EG

GENERAL NOTES

1. MATERIAL ____
2. FINISH ____
3. COLOR ____
4. TOP ____
5. DOOR CLOSERS SHALL BE CAPABLE OF HOLDING DOOR AGAINST PRESSURE OF A/C, NORMAL CONDITIONS OF LIST & TRIM & MOTION OF SHIP.
6. ALL DOOR CLOSERS SHALL BE AT LEAST TWO SIZES LARGE THAN THAT RECOMMENDED BY MFR FOR LAND USE.
7. CLOSERS TO BE FURNISHED WITH REQ'D FASTENINGS.
8. CLOSERS TO BE PROVIDED WITH HOLD OPEN FEATURES AS NOTED.
9. THE LCN INTERIOR DOOR CLOSER IS THE SURFACE TYPE LCN "SMOOTHEE"
10. EXTERIOR DOOR CLOSER IS THE LCN 5015, CONCEALED OVERHEAD, CAST IRON W/CORROSION RESISTANT STEEL ARMS.

No.	TITLE	Sht.	H.B.	S.Y. No.

REFERENCES

HULL/S 613-614-615
SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE: MISC. JOINER HARDWARE
DOORS CLOSERS
F.F. No. 352 SHT. 1 of 3

DISTRIB.	S	P
W	1	
JOB		5
ROCH.		
P.O.		2
FILE		1
CONT.		1

MILL W/POVA
STD. No. ____
DRAWN BY jkl DATE 5-11-77
SCALE: ____

FASTENER-LINING ____ QUANTITY PER ITEM
FASTENER-DIVISIONAL ____ QUANTITY PER ITEM
FASTENER-STEEL ____ QUANTITY PER ITEM

RELEASED 10-4-77
QUANTITY GIVEN FOR ONE SHIP FURNISH FOR 3 SHIP/S.

SHIPYARD No. ____
MARAD No. ____
H.B. No. 5300-550 SHT 6 OF 16
REV. B

5300-550

SEPT. '80
6X

CLOSER SCHEDULE

DECK	DOOR №	SWING	DOOR TYPE	DOOR WIDTH	DEGREE SWING	CLOSER TYPE	CLOSER SIZE	REMARKS
"A"	A 30	RHR	2" ST. STL. EXT.	30"	90°	LCN 5015		
	A 30-1	LHR	2" ST. STL. EXT.	30"	180°	LCN 5015		
CAMBER	R 1	RH	1⅜ ST. STL. INT.	30"	90°	LCN SURF		
	R 1-1	RHR	2" ST. STL. EXT.	30"	180°	LCN 5015		
	R 2	LH	1⅜ ST. STL. INT.	30"	90°	LCN SURF		
	R 2-1	LHR	2" ST. STL. EXT.	30"	180°	LCN 5015		
	R 7	LHR	1⅜ STL.INT.	30"	90°	LCN SURF		
	R 10	RHR	2" ST. STL. EXT.	30"	180°	LCN 5015		
	R 13	RHR	1⅜ STL. INT.	30"	180°	LCN SURF		PARALLEL ARM
	R 14-1	RHR	2" ST. STL. EXT.	30"	180°	LCN 5015		
	R 15	LH	1⅜ STL.INT.	30"	90°	LCN SURF		HULLS 613 & 614 ONLY
	R 15-1	LH	1⅜ STL.INT.	30"	90°	LCN SURF		HULLS 613 & 614 ONLY
	R 15-2	RH	1⅜ STL.INT.	30"	140°	LCN SURF		HULL 615 ONLY
	R 15-3	RH	1⅜ STL.INT.	30"	180°	LCN SURF	PARALLEL ARM	HULL 615 ONLY
	R 16	RH	1⅜ STL.INT.	30"	90°	LCN SURF		HULLS 613 & 614 ONLY
	R 16-1	LH	1⅜ STL.INT.	30"	140°	LCN SURF		HULLS 613 & 614 ONLY
	R 17	RH	1⅜ STL.INT.	30"	140°	LCN SURF		HULLS 613 & 614 ONLY
	R 17-2	LH	1⅜ STL.INT.	30"	140°	LCN SURF		HULL 615 ONLY
	R 18	LHR	1⅜ STL.INT.	24"	90°	LCN SURF		
	R 21	LH	1⅜ STL.INT.	30"	90°	LCN SURF		
	R 21-1	RH	1⅜ STL.INT.	30"	90°	LCN SURF		
	R 23	LHR	1⅜ STL.INT.	30"	180°	LCN SURF		PARALLEL ARM
	R 25	LH	1⅜ STL.INT.	30"	90°	LCN SURF		HULL 615 ONLY
	R 25-1	LH	1⅜ STL.INT.	30"	90°	LCN SURF		HULLS 613 & 614 ONLY
	R 28	LHR	1⅜ STL.INT.	26"	140°	LCN SURF		
	R 30	RH	1⅜ STL.INT.	30"	90°	LCN SURF		

REVISIONS

No.	DESCRIPTION	APPROVED DATE	APPROVED BY

GENERAL NOTES

1. MATERIAL________
2. FINISH________
3. COLOR________
4. TOP________
5. DOOR CLOSERS SHALL BE CAPABLE OF HOLDING DOOR AGAINST PRESSURE OF A/C, NORMAL CONDITIONS OF LIST & TRIM & MOTION OF SHIP.
6. ALL DOOR CLOSERS SHALL BE AT LEAST TWO SIZES LARGE THAN THAT RECOMMENDED BY MFR FOR LAND USE.
7. CLOSERS TO BE FURNISHED WITH REQ'D FASTENINGS.
8. CLOSERS TO BE PROVIDED WITH HOLD OPEN FEATURES AS NOTED.
9. THE LCN INTERIOR DOOR CLOSER IS THE SURFACE TYPE LCN "SMOOTHEE"
10. EXTERIOR DOOR CLOSER IS THE LCN 5015, CONCEALED OVERHEAD, CAST IRON W/CORROSION RESISTANT STEEL ARMS.

REFERENCES

No.	TITLE	Sht.	H.B.	S.Y. No.

HULL/S 613-614-615

SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE: MISC. JOINER HARDWARE
DOORS CLOSERS

F.F. No. 352 SHT. 2 of 3

DISTRIB.	S	P
W	1	
JOB		5
ROCH.		
P.O.		2
FILE		1
CONT.		1
HBNN		1

MILL W/POVA
STD. No.
DRAWN BY jkl DATE 5-11-77
SCALE:

FASTENER-LINING — QUANTITY PER ITEM
FASTENER-DIVISIONAL — QUANTITY PER ITEM
FASTENER-STEEL — QUANTITY PER ITEM

RELEASED 10-4-77
QUANTITY GIVEN FOR ONE SHIP
FURNISH FOR 3 SHIP/S.

SHIPYARD No.
MARAD No.
H.B. No. 5300-550 SHT 7 OF 16
REV. ○

5300-550

SEPT. '80

6X

CLOSER SCHEDULE

DECK	DOOR №	SWING	DOOR TYPE	DOOR WIDTH	DEGREE SWING	CLOSER TYPE	CLOSER SIZE	REMARKS
78'-4" FLAT	78-1	RHR	1⅜ STL. INT.	30"	90°	LCN SURF		
60'-0" FLAT	60-2	LHR	1⅜ STL. INT.	30"	90°	LCN SURF		HULLS 613 & 614 ONLY
	60-3	LHR	1⅜ STL. INT.	30"	90°	LCN SURF		HULLS 613 & 614 ONLY
	60-4	RHR	1⅜ STL. INT.	30"	90°	LCN SURF		HULLS 613 & 614 ONLY
	60-5	LHR	1⅜ STL. INT.	30"	90°	LCN SURF		HULL 615 ONLY
	60-6	LHR	1⅜ STL. INT.	30"	90°	LCN SURF		HULL 615 ONLY
	60-7	LHR	1⅜ STL. INT.	30"	90°	LCN SURF		HULL 615 ONLY
	60-8	RHR	1⅜ STL. INT.	30"	90°	LCN SURF		HULL 615 ONLY

SHIP CLOSERS ON THIS SHEET TO HBNN.

REVISIONS

No.	DESCRIPTION	APPROVED DATE	APPROVED BY

GENERAL NOTES

No.	
1.	MATERIAL ______
2.	FINISH ______
3.	COLOR ______
4.	TOP ______
5.	DOOR CLOSERS SHALL BE CAPABLE OF HOLDING DOOR AGAINST PRESSURE OF A/C, NORMAL CONDITIONS OF LIST & TRIM & MOTION OF SHIP.
6.	ALL DOOR CLOSERS SHALL BE AT LEAST TWO SIZES LARGE THAN THAT RECOMMENDED BY MFR FOR LAND USE.
7.	CLOSERS TO BE FURNISHED WITH REQ'D FASTENINGS.
8.	CLOSERS TO BE PROVIDED WITH HOLD OPEN FEATURES AS NOTED.
9.	THE LCN INTERIOR DOOR CLOSER IS THE SURFACE TYPE LCN "SMOOTHEE"
10.	EXTERIOR DOOR CLOSER IS THE LCN 5015, CONCEALED OVERHEAD, CAST IRON W/CORROSION RESISTANT STEEL ARMS.

No.	TITLE	Sht.	H.B.	S.Y. No.

REFERENCES

HULL/S 613-614-615

SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE: MISC. JOINER HARDWARE
DOORS CLOSERS

F.F. No. 352
SHT. 3 of 3

SHIPYARD No. ______
MARAD No. ______
H.B. No. 5300-550 SHT 8 OF 16

REV. 0

DISTRIB.	S	P
W	1	
JOB		5
ROCH.		
P.O.		2
FILE		1
CONT.		1
HBNN		1

MILL W/POVA
STD. No. ______
DRAWN BY jkl DATE 5-11-77
SCALE: ______

FASTENER-LINING ______ QUANTITY PER ITEM
FASTENER-DIVISIONAL ______ QUANTITY PER ITEM
FASTENER-STEEL ______ QUANTITY PER ITEM

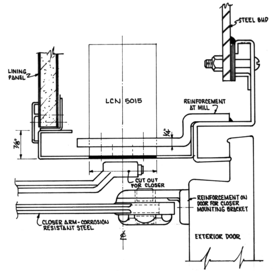
RELEASED 10-4-77
QUANTITY GIVEN FOR ONE SHIP
FURNISH FOR 3 SHIP/S.

5300-550

MICRO-MASTER 105 mm
K+E

SEPT. '80
6X

REVISIONS			
No.	DESCRIPTION	APPROVED DATE	BY


STEEL BHD
LINING PANEL
LCN 5015
REINFORCEMENT AT MILL
1/4"
7/8"
CUT OUT FOR CLOSER
REINFORCEMENT ON DOOR FOR CLOSER MOUNTING BRACKET
CLOSER ARM-CORROSION RESISTANT STEEL
℄
EXTERIOR DOOR

SECTION THROUGH HEAD OF DOOR
WITH CONCEALED DOOR CLOSER

No.	GENERAL NOTES
1.	MATERIAL
2.	FINISH
3.	COLOR
4.	TOP

No.	TITLE	Sht.	H.B.	S.Y. No.

REFERENCES

HULL/S 613-614-615

SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE:
MISCELLANEOUS JOINER HARDWARE
LCN CONCEALED DOOR CLOSER
TYPICAL INSTALLATION

F.F. No. 352-1

SHIPYARD No.

MARAD No.

H.B. No. 5300-550 SHT 9 OF 16

REV. 0

INFO ONLY

DISTRIB.	S	P
W	1	
JOB		5
ROCH.		
P.O.		2
FILE		1
CONT.		1
HBNN		1

MILL W/POVA

STD. No.

DRAWN BY M.R.F. DATE 11-15-73

SCALE:

FASTENER-LINING	FASTENER-DIVISIONAL	FASTENER-STEEL
QUANTITY PER ITEM	QUANTITY PER ITEM	QUANTITY PER ITEM

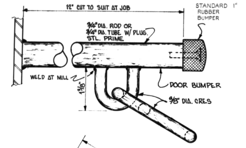
RELEASED 10-4-77

QUANTITY GIVEN FOR ONE SHIP
FURNISH FOR 3 SHIP/S.

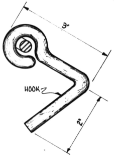
5300-550

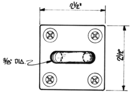
SEPT. '80

6X


12" CUT TO SUIT AT JOB
STANDARD 1" RUBBER BUMPER
3/4" DIA. ROD OR 3/4" DIA. TUBE W/ PLUG. STL. PRIME
WELD AT MILL
1 3/16"
DOOR BUMPER
3/8" DIA. CRES

DOOR	SWING
D 9-1	LH
B 33	LH
B 33-1	RH
A 16-1	RH
A 30	LH
A 30-1	RH
R 1-1	LH
R 2-1	RH
R 10	LH
R 14-1	LH
ELEVATOR MACHY. ACCESS	LH
CATWALK ACCESS	LH
↓	RH




2 1/2"
3/8" DIA.
2 1/2"

11 GA. STAINLESS STEEL PLATE; FASTEN TO DOOR W/ SCREWS - BY WAYNE. (13) REQUIRED

AS SHOWN FOR RIGHT-HAND HINGED DOORS

HOOK ON OPPOSITE SIDE OF BUMPER FOR LEFT-HAND HINGED DOORS

REVISIONS

No.	DESCRIPTION	APPROVED DATE	APPROVED BY
B	ADDED SPARE QTY. TO NOTE 5	5/23 78	EG

GENERAL NOTES

No.	
1.	MATERIAL STAINLESS STEEL
2.	FINISH NATURAL - 2B FINISH
3.	COLOR
4.	TOP
5.	WAYNE TO FURNISH (17) SETS OF BUMPERS, HOOKS AND DOOR PLATES. 9 FOR RIGHT-HAND HINGED DOORS. 8 FOR LEFT-HAND HINGED DOORS.

No.	TITLE	Sht.	H.B.	S.Y. No.

REFERENCES

HULL/S 613-614-615

SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE: MISCELLANEOUS JOINER HARDWARE HOLD-BACK HOOKS FOR STRUCTURAL DOORS & EXTERIOR JOINER DOORS

F.F. No. 355-1

DISTRIB.	S	P
W	1	
JOB		5
ROCH.		
P.O.		
FILE		1
CONT.		1

MILL W

STD. No.

DRAWN BY M.R.F. DATE 10-24-73

SCALE: FULL SCALE

FASTENER-LINING	FASTENER-DIVISIONAL	FASTENER-STEEL
		TO DOOR
		10-24 x 3/4 FH
QUANTITY PER ITEM	QUANTITY PER ITEM	QUANTITY PER ITEM

RELEASED 10-4-77

QUANTITY GIVEN FOR ONE SHIP FURNISH FOR 3 SHIP/S.

SHIPYARD No.

MARAD No.

H.B. No. 5300-550 SHT 10 OF 16

REV. A

5300-550

SEPT. '80

6X

SCHEDULE

DECK	LOCATION	QUAN.		DECK	LOCATION	QUAN.	
BRIDGE	SEA CABIN	2		"B"	PUMPMAN S.R. B 10	2	
					QMED S.R. B 12	2	
					QMED S.R. B 15	2	
"D"	PILOT S.R. D 2	2			CREW'S LOUNGE B 16	6	
	MASTER'S OFFICE D 3	2			ABS S.R. B 18	2	
	MASTER S.R. D 6	2			ABS S.R. B 23	2	
	RADIO OPR. S.R. D 11	2			BOS'N S.R. B 25	2	
	RELIEF OFCR. S.R. D 17	2			ABS S.R. B 28	2	
	RELIEF OFCR. S.R. D 21	2			ABS S.R. B 31	2	
	CH. ENGR. S.R. D 24	2			ABS S.R. B 32	2	
	CH. ENGR'S OFFICE D 27	2					
	OWNER S.R. D 28	2					
				"A"	GEN. UTILITYMAN S.R. A 2	2	
					GEN. UTILITYMAN S.R. A 5	2	
"C"	OFFICERS' LOUNGE C 1	6			DBL. REPAIR CREW S.R. A 7	4	
	3RD MATE S.R. C 2	2			DBL. REPAIR CREW S.R. A 8	4	
	1ST MATE S.R. C 6	2			DBL. REPAIR CREW S.R. A 11	4	
	2ND MATE S.R. C 9	2			HOSPITAL A 15	2	
	CADET (DECK) S.R. C 12	2			COOK/BAKER S.R. A 21	2	
	CADET (ENGR) S.R. C 13	2			STD/COOK S.R. A 23	2	
	OFFICERS' LAUNDRY C 16	4			STD/UTIL. S.R. A 26	2	
	2ND ASST. ENGR. S.R. C 20	2			STD/UTIL. S.R. A 29	2	
	1ST ASST. ENGR. S.R. C 23	2					
	3RD ASST. ENGR. S.R. C 27	2					
				CAMBER	CHANGE ROOM R 6	6	
					CREW'S MESS RM. R 15 R 15-2	6	H 613/614 H 615
"B"	ABS S.R. B 3	2			OFFICERS' DINING RM. R 21	6	
	QMED S.R. B 5	2			CREW LAUNDRY R 25-1 R 25	4	H 615 H 613/614
	QMED S.R. B 8	2					

DISTRIB.	S	P
W	1	
JOB		5
ROCH.		
P.O.		
FILE		1
CONT.		1

MILL W
STD. No.
DRAWN BY jhl DATE 6-2-77
SCALE:

FASTENER-LINING
QUANTITY PER ITEM

FASTENER-DIVISIONAL
QUANTITY PER ITEM

FASTENER-STEEL
QUANTITY PER ITEM

RELEASED 10-4-77
QUANTITY GIVEN FOR ONE SHIP
FURNISH FOR 3 SHIP/S.

REVISIONS				
No.	DESCRIPTION	DATE	APPROVED DATE	BY

No.	GENERAL NOTES
1.	MATERIAL
2.	FINISH
3.	COLOR
4.	TOP
5.	FOR COAT & HAT HOOK DETAILS SEE SKETCH FF 353 SHT. 2 OF 2.

TOTAL - 124 PER HULL

No.	TITLE	Sht.	H.B.	S.Y. No.

REFERENCES

HULL/S 613-614-615
SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE:
MISC. JOINER HARDWARE
COAT & HAT HOOKS

F.F. NO. 353
SHT. 1 OF 2

SHIPYARD No.
MARAD No.
H.B. No. 5300-550 SHT 11 OF 16
REV. 0

5300-550

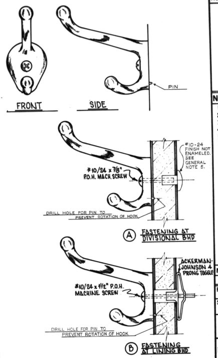
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

6X

SCHEDULE

DECK	LOCATION	QUAN.	



FRONT
SIDE
PIN
#10-24 FINISH NOT ENAMELED. SEE GENERAL NOTE 5.
#10/24 x 7/8" P.O.H. MACH. SCREW
DRILL HOLE FOR PIN TO PREVENT ROTATION OF HOOK
Ⓐ FASTENING AT DIVISIONAL BHD
ACKERMAN-JOHNSON 4 PRONG TOGGLE
#10/24 x 1 1/2" P.O.H. MACHINE SCREW
DRILL HOLE FOR PIN TO PREVENT ROTATION OF HOOK
Ⓑ FASTENING AT LINING BHD

REVISIONS

No.	DESCRIPTION	APPROVED DATE	APPROVED BY

GENERAL NOTES

No.	GENERAL NOTES
1.	MATERIAL WHITE BRONZE
2.	FINISH U.S. 25 D
3.	COLOR
4.	TOP
5.	EXPOSED BACKSIDE FASTENERS AT TYPE "A" ARE TO HAVE SAME FINISH AND COLOR AS THE SURFACE THEY ARE MOUNTED ON.

REFERENCES

No.	TITLE	Sht.	H.B.	S.Y. No.

HULL/S 613 - 614 - 615

SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE: MISCELLANEOUS JOINER HARDWARE
COAT & HAT HOOKS

F.F. No. 353
SHT. 2 of 2

SHIPYARD No.
MARAD No.
H.B. No. 5300-550 SHT 12 OF 16

REV. ○

DISTRIB.	S	P
W	1	
JOB		5
ROCH.		
P.O.		
FILE		1
CONT.		1

MILL W

STD. No.

DRAWN BY M.R.F. DATE 11-15-73

SCALE:

FASTENER-LINING	FASTENER-DIVISIONAL	FASTENER-STEEL
QUANTITY PER ITEM	QUANTITY PER ITEM	QUANTITY PER ITEM

RELEASED 10-4-77

QUANTITY GIVEN FOR ONE SHIP
FURNISH FOR 3 SHIP/S.

5300-550

SEPT. '80

6X

SCHEDULE

DK	DOOR Nº	COMPARTMENT	COLOR	LENGTH	DK	DOOR Nº	COMPARTMENT	COLOR	LENGTH
"D"	D2-W	PILOT WR.	C-611	4'-4 1/8"	"B"	B18-W	ABS WR.	C-521	2'-7 7/8"
	D6-W	MASTER WR. FWD	C-610	2'-7 7/8"		B23-W	ABS WR.	C-521	2'-7 7/8"
	D6-W-1	MASTER WR. AFT	C-610	2'-7 3/16"		B25-W	BOS'N WR.	C-521	2'-7 7/8"
	D11-W	RADIO OPR. WR.	C-611	4'-4 1/8"		B28-W	ABS WR.	C-521	2'-7 7/8"
	D17-W	RELIEF OFCR WR.	C-611	4'-4 1/8"		B31-W	ABS WR.	C-521	2'-7 7/8"
	D21-W	RELIEF OFCR WR.	C-611	4'-6 5/8"		B32-W	ABS WR.	C-521	2'-7 7/8"
	D24-W	CH. ENGR. WR. FWD	C-610	2'-7 7/8"					
	D24-W-1	CH. ENGR. WR. AFT	C-610	2'-7 3/16"					
	D28-W	OWNER WR.	C-611	4'-4 1/8"	"A"	A2-W	GEN. UTILITYMAN WR.	C-521	2'-7 7/8"
						A5-W	GEN. UTILITYMAN WR.	C-521	2'-7 7/8"
						A7-W	DBL. REPAIR CREW WR.	C-521	2'-5"
"C"	C2-W	3RD MATE WR.	C-611	4'-4 1/8"		A7-W-1	DBL. REPAIR CREW WR.	C-521	2'-5"
	C6-W	1ST MATE WR. FWD	C-610	2'-7 7/8"		A8-W	DBL. REPAIR CREW WR.	C-521	2'-5 13/16"
	C6-W-1	1ST MATE WR. AFT	C-610	2'-7 3/16"		A8-W-1	DBL. REPAIR CREW WR.	C-521	2'-5 13/16"
	C9-W	2ND MATE WR.	C-611	4'-4 1/8"		A11-W	DBL. REPAIR CREW WR.	C-521	2'-8"
	C12-W	CADET (DECK) WR.	C-611	4'-4 1/8"		A11-W-1	DBL. REPAIR CREW WR.	C-521	2'-8"
	C13-W	CADET (ENGR) WR.	C-611	4'-4 1/8"		A15-W	HOSPITAL WR.	C-521	2'-4 5/8"
	C20-W	2ND ASST. ENGR. WR.	C-611	4'-4 1/8"		A21-W	COOK/BAKER WR.	C-521	2'-4 5/8"
	C23-W	1ST ASST. ENGR. WR. AFT	C-610	2'-7 3/16"		A23-W	STD/COOK WR.	C-521	2'-7 7/8"
	C23-W-1	1ST ASST. ENGR. WR. FWD	C-610	2'-7 7/8"		A26-W	STD/UTIL. WR.	C-521	2'-7 7/8"
	C27-W	3RD ASST. ENGR. WR.	C-611	4'-4 1/8"		A29-W	STD/UTIL. WR.	C-521	2'-7 7/8"
"B"	B3-W	ABS WR.	C-521	2'-7 7/8"					
	B5-W	QMED WR.	C-521	2'-7 7/8"					
	B8-W	QMED WR.	C-521	2'-7 7/8"					
	B10-W	PUMPMAN WR.	C-521	2'-7 7/8"					
	B12-W	QMED WR.	C-521	2'-7 7/8"					
	B15-W	QMED WR.	C-521	2'-7 7/8"					

REVISIONS

No.	DESCRIPTION	DATE	APPROVED DATE	APPROVED BY

GENERAL NOTES

No.	
1.	MATERIAL
2.	FINISH
3.	COLOR
4.	TOP

REFERENCES

No.	TITLE	Sht.	H.B.	S.Y. No.

HULL/S 613-614-615

SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE: WARDROBE SHELF SCHEDULE

F.F. NO. 161-1 SHT. 1 or 2

SHIPYARD No.

MARAD No.

H.B. No. 5300-550 SHT 13 OF 16

REV. 0

DISTRIB.	S	P
W	1	
JOB		5
ROCH.		
P.O.		
FILE		1
CONT.		1

MILL W

STD. No.

DRAWN BY jkl DATE 6-17-77

SCALE:

FASTENER-LINING

QUANTITY PER ITEM

FASTENER-DIVISIONAL

QUANTITY PER ITEM

FASTENER-STEEL

QUANTITY PER ITEM

RELEASED 10-4-77

QUANTITY GIVEN FOR ONE SHIP
FURNISH FOR 3 SHIP/S.

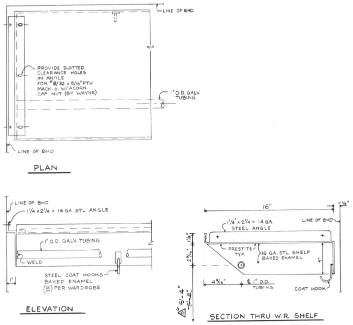
5300-550

MICRO-MASTER 105 mm

K+E

SEPT. '80

6X


LINE OF BHD.
PROVIDE SLOTTED CLEARANCE HOLES IN ANGLE FOR #8/32 × 5/16" PTH MACH. S. W/ACORN CAP NUT (BY WAYNE)
1" O.D. GALV. TUBING
LINE OF BHD
PLAN
LINE OF BHD
1¼ x 2¼ × 14 GA STL ANGLE
1" O.D. GALV. TUBING
WELD
1"
STEEL COAT HOOKS BAKED ENAMEL (8) PER WARDROBE
ELEVATION
16"
¼"
1¼" x 2¼ × 14 GA STEEL ANGLE
LINE OF BHD
PRESTITE TYP.
16 GA. STL SHELF BAKED ENAMEL
1⅛"
2 9/16"
4"
4 9/16"
℄ 1" O.D. TUBING
COAT HOOK
B 5'-4"
~~5'-8"~~
SECTION THRU W.R. SHELF

REVISIONS				
No.	DESCRIPTION	DATE	APPROVED DATE	BY
B	6) REV. 5'-8" DIM TO 5'-4" 12-12-77 GW			

No.	GENERAL NOTES
1.	MATERIAL ______
2.	FINISH ______
3.	COLOR ______
4.	TOP ______

No.	TITLE	Sht.	H.B.	S.Y. No.

REFERENCES

HULL/S 613 - 614 - 615

SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE: WARDROBE SHELF DETAILS

F.F. NO. 161-1 SHT. 2 OF 2

DISTRIB.	S	P
W	1	
JOB		6
ROCH.		
P.O.		
FILE		1
CONT.		1

MILL W

STD. No. ______

DRAWN BY jkl DATE 6-3-77

SCALE: —

FASTENER-LINING	FASTENER-DIVISIONAL	FASTENER-STEEL
#18	#728 & #6	
QUANTITY PER ITEM	QUANTITY PER ITEM	QUANTITY PER ITEM

RELEASED 10-4-77

QUANTITY GIVEN FOR ONE SHIP FURNISH FOR 3 SHIP/S.

SHIPYARD No. ______

MARAD No. ______

H.B. No. 5300-550 SHT 14 OF 16

REV. B

5300-550

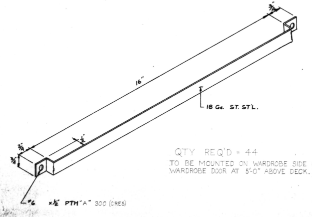
MICRO-MASTER 105 mm

SEPT. '80

6X

REVISIONS			
No.	DESCRIPTION	APPROVED DATE	BY

No.	GENERAL NOTES
1.	MATERIAL 18 Ga. ST. ST'L
2.	FINISH #4 POLISH
3.	COLOR
4.	TOP



QTY REQ'D = 44

TO BE MOUNTED ON WARDROBE SIDE OF WARDROBE DOOR AT 5'-0" ABOVE DECK.

No.	TITLE	Sht.	H.B.	S.Y. No.

REFERENCES

HULL/S 613-614-615

SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE: **TIE RACK**

F.F. No. 364-1

DISTRIB.	S	P
W		
JOB		5
ROCH.		
P.O.		
FILE		1
CONT.		1

MILL W

STD. No.

DRAWN BY jkl DATE 6-17-77

SCALE:

FASTENER-LINING QUANTITY PER ITEM

FASTENER-DIVISIONAL QUANTITY PER ITEM

FASTENER- DOOR (2) # 248 QUANTITY PER ITEM

RELEASED 10-4-77

QUANTITY GIVEN FOR ONE SHIP FURNISH FOR 3 SHIP/S.

SHIPYARD No.

MARAD No.

H.B. No. 5300-550 SHT 15 OF 16

REV. 0

5300-550

SEPT. '80

6X

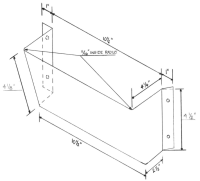
REVISIONS				
No.	DESCRIPTION		APPROVED DATE	BY

FURNISH (2) PER WARDROBE
QTY = 88

TO BE MOUNTED ON WARDROBE SIDE OF WARDROBE DOOR AT 1'-0" AND 2'-0" FROM TOP OF SHOE RACK TO DECK.

(38) TO BE PAINTED COLOR C-610 FOR INSTALLATION ON "D" & "C" DECKS.

(50) TO BE PAINTED COLOR C-521 FOR INSTALLATION ON "B" & "A" DECKS.



No.	GENERAL NOTES
1.	MATERIAL 16 GA. STEEL
2.	FINISH BAKED ENAMEL
3.	COLOR
4.	TOP

No.	TITLE	Sht.	H.B.	S.Y. No.

REFERENCES

HULL/S 613-614-615

SHIPYARD NEWPORT NEWS

HOPEMAN BROTHERS, INC.
NEW YORK, N.Y.

TITLE: SHOE RACK

F.F. NO. 363

SHIPYARD No.

MARAD No.

H.B. No. 5300-550 SHT 16 OF 16

REV. 0

DISTRIB.	S	P
W	1	
JOB		5
ROCH.		
P.O.		
FILE		1
CONT.		1

MILL W

STD. No.

DRAWN BY jkl DATE 6-17-77

SCALE: —

FASTENER-LINING	FASTENER-DIVISIONAL	FASTENER-DOOR
		(4) # 212
QUANTITY PER ITEM	QUANTITY PER ITEM	QUANTITY PER ITEM

RELEASED 10-4-77

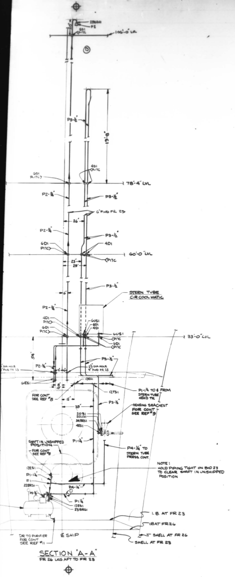
QUANTITY GIVEN FOR ONE SHIP FURNISH FOR 3 SHIP/S.

5300-550

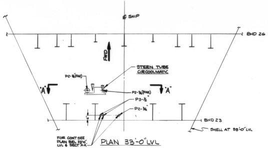
MICRO-MASTER 105 mm

SEPT. '80

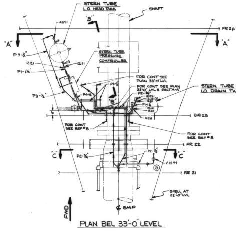
6X


106'-0" LVL
78'-4" LVL
60'-0" LVL
33'-0" LVL
19'-8"
P3-½"
P2-¾"
4D1
6D1
STERN TUBE CIRCOOLMATIC
12TS1
P1-1¼" TO & FROM STERN TUBE HEAD TK
SENSING SEACHEST FOR CONT SEE REF #9
SHAFT IN UNSHIPPED POSITION
P4-¼" TO STERN TUBE PRESS. CONT.
NOTE: HOLD PIPING TIGHT ON BHD 23 TO CLEAR SHAFT IN UNSHIPPED POSITION
I.B. AT FR 23
I.B. AT FR 26
SHELL AT FR 26
SHELL AT FR 23
DR TO PURIFIER FOR CONT SEE REF #11
℄ SHIP

SECTION 'A-A'
FR 26 LKG AFT TO FR 23


℄ SHIP
BHD 26
FWD
STERN TUBE CIRCOOLMATIC
"A"
P2-¾"
P3-½"
BHD 23
SHELL AT 33'-0" LVL
FOR CONT SEE PLAN BEL 33'-0" LVL & SECT 'A-A'

PLAN 33'-0" LVL


STERN TUBE L.O. HEAD TANK
SHAFT
"B"
"A"
FR 26
STERN TUBE PRESSURE CONTROLLER
P3-½"
P1-1¼"
FOR CONT SEE PLAN 33'-0" LVL
FOR CONT SEE PLAN 33'-0" LVL & SECT 'A-A'
STERN TUBE LO DRAIN TK
BHD 23
FOR CONT SEE REF #8
FR 22
"C"
P2-¾"
V-1299
FR 21
SHELL AT 22'-0" LVL
FWD
℄ SHIP

PLAN BEL 33'-0" LEVEL

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH	OWNER DATE	OWNER APPD
A	ALL	INITIAL ISSUE	7/15/76	[illegible]	—	—
B	-	PLAN BEL 33'-0" LVL & SECT 'C-C' ALT PIPING TO FWD SHAFT SEAL ADDED DRAIN VALVE V1299 DIMENSIONED NORMAL OIL LEVEL ELEV 'B-B'	6/15/77	[illegible]	—	—
C	-	ADDED CHK VALVE ON DISCHARGE SIDE STERN TUBE L.O. DRN TK	10/1/77	[illegible]	—	—
D	-	SECT 'A-A', RELOCATED STERN TUBE L.O. VENT FROM 78'-4" LVL TO 106'-0" LVL. (WORK ACCOMP ON 613C BY LIAISON NO. 613C-343-115)	[illegible]	[illegible]	-	-

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN DEVELOPED IN ACCORDANCE WITH REF #1,2 & 3
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD & AMERICAN BUREAU OF SHIPPING. SEE REF #3 FOR ACCEPTABLE MAT'L.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS & SHALL MEET THE REQUIREMENTS OF THE USCG, ABS & REF #7.
4. COUPLINGS SHOWN IN LIST OF MATERIAL ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS & HANGERS DO NOT INFRINGE ON THE SPACE REQ'D FOR OVERHAUL OF HEAT EXCHANGERS, PUMPS ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REF #4.
8. TESTS ARE TO BE IN ACCORDANCE WITH REF #3.
9. ALL PIPING ON THIS DWG IS CLASS II.
10. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS. SOCKET WELDS TYPE P-14 & FLANGE WELDS TYPE P-16A ON REF #7. EXCEPT AS OTHERWISE INDICATED.
11. LOCATION DIMENSION ARE FOR REFERENCE ONLY & MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
12. ALL HOLECUTS ARE PROVIDED ON STRUCTURAL DRAWINGS
13. HANGERS ORDERED IN LIST OF MAT'L ARE TO BE USED AS REQ'D IN ACCORDANCE WITH REF #5 UNLESS OTHERWISE NOTED.
14. THIS SYSTEM REQUIRES SPECIAL CLEANING SEE REF #6.

FOR LIST OF MATERIAL NOTES & REF SEE NN DWG Nº 6302-55

DWG. REV.—HULL APPLIC						
REV	NN HULLS ONLY					
A	YES	YES	YES			
B	YES	YES	YES			
C	YES	YES	YES			
D	NO	YES	NO			

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING YES
REMARKS
DATE 2-26-7 SIGNED J.H. Johnson

GROUP: MC NO.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS
OWNERS
ABS
USCG NR

NO.	REFERENCES	DWG NO.
11	PP ARR LO FILL & PURIF SYS – PLAN	6200-623
10	LIST OF PRESS. & VAC GAGES & THERM FURN BY SUB CONTR	6750-484
9	ARR DISCHARGE SEA CONNECTIONS	6000-320
8	PP ARR AFT BALLAST TK – PLAN	2280-708
7	FAB & WELDING INSTRUCTIONS FOR CL I & II PIPING	257035
6	PROCEDURE FOR CLEANING LO SYS	6200-608
5	STANDARD PIPE HANGERS	257056
4	PAINTING SCHEDULE	8300-40 ⓑ 41 △
3	DIAG MN LO SYSTEM – LIST OF MAT'L	6200-610
2	DIAG MN LO SYSTEM – ARR	6200-609
1	1000# STERN TUBE BEARING & SEALS LUBE OIL SYSTEM & RTD INSTALLATION	6302-C2 SHT 1 & 2

ⓑ HULLS 613C & 614C
△ HULL 615C ONLY

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

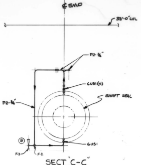
SCALE ½" = 1 FT
DRAWN D.L. HOFFMAN
CHECKED T.E. SEAMAN
SECT MGR J.H. Johnson
DATE COMPL. 7-13-76
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 7-14-76
TECH APPROVAL NR
C S D APPROVAL R.L. Harrington

PIPING ARR MAIN SHAFT LUBE OIL SYSTEM

U S M A DESIGN T11-S-1162
U S M A DWG NO.
HULL NO.
DWG NO. 6302-54
REV D
SHEET NO. 1 OF 1

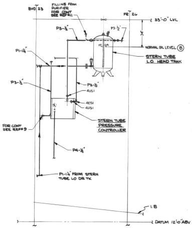
6302.54

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA • ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
FRAME 1
10X



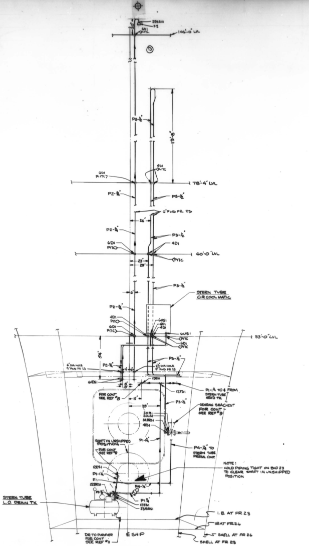
℄ SHIP
33'-0" LVL
P2-¾"
6US1(N)
SHAFT SEAL
P2-¾"
6US1
Ⓑ
F-3
F-2

SECT "C-C"
LKG AFT TO
FR 21



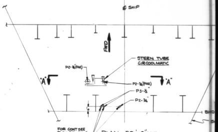
BHD 23
FILLING FROM
PURIFIER
FOR CONT
SEE REF #11
FR 26
33'-0" LVL
P3-½"
P3-½"
34"
NORMAL OIL LEVEL Ⓑ
P1-1¼"
STERN TUBE
L.O. HEAD TANK
P3-½"
P3-½"
4US1
4ES1
4US1
STERN TUBE
PRESSURE
CONTROLLER
FOR CONT
SEE REF #9
P4-¼"
P1-1¼" FROM STERN
TUBE LO DR TK
I.B.
DATUM 12'-0" ABV ℄

ELEV "B-B"



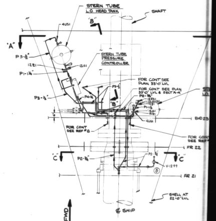
23BRS1
P2
6D1
P17C
106'-0" LVL
Ⓓ
P3-½"
19'-8"
6D1
P17C
4D1
P17C
78'-4" LVL
P2-¾"
P3-½"
6" FWD FR 23
26"
P2-¾"
P3-½"
6D1
P17C
4D1
60'-0" LVL
P17C
23"
29"
P3-½"
6"
STERN TUBE
CIR COOL MATIC
P2-¾"
4D1
P17C
6D1
P17C
6US1
6D1
4D1
6US1
P17C
6D1
P17C
33'-0" LVL
34"
P3-½"
6" DIA HOLE
9" FWD FR 23
P2-¾"
2½" DIA HOLE
9" FWD FR 23
12ES1
6ES1
8"
10"
12TS1
P1-1¼ TO & FROM
STERN TUBE
HEAD TK
FOR CONT
SEE REF #8
15"
P3-½"
39"
SENSING SEACHEST
FOR CONT
SEE REF #9
20Z1
20JS1
34BRS1
4ES1
P1-1¼"
SHAFT IN UNSHIPPED
POSITION
FOR CONT
SEE REF #8
P4-¼" TO
STERN TUBE
PRESS. CONT.
NOTE:
HOLD PIPING TIGHT ON BHD 23
TO CLEAR SHAFT IN UNSHIPPED
POSITION
12ES1
P1-1¼"
F1
22BRS1
P5-⅜"
P4-¼"
P1 1¼"
12ES1
23BRS1
STERN TUBE
L.O. DRAIN TK
I.B. AT FR 23
I.B. AT FR 26
DR TO PURIFIER
FOR CONT
SEE REF #11
℄ SHIP
SHELL AT FR 26
SHELL AT FR 23

SECTION "A-A"
FR 26 LKG AFT TO FR 23



℄ SHIP
FWD
STERN TUBE
CIR COOL MATIC
P2-¾(FAR)
P2-¾(FAR)
"A"
"A"
P3-½"
P2-¾"
6"
BHD
FOR CONT SEE
PLAN BEL 33'-0"
LVL & SECT "A-A"

PLAN 33'-0" LVL



STERN TUBE
L.O. HEAD TANK
SHAFT
"B"
4US1
"A"
P3-½"
STERN TUBE
PRESSURE
CONTROLLER
12Z1
12JS1
P1-1¼"
FOR CONT SEE
PLAN 33'-0" LVL
P3-½"
FOR CONT SEE PLAN
33'-0" LVL & SECT "A-A"
P2-¾"
P3-½"
P4-¼
"B"
12ES1
P1-1¼
12JS1
12B1
12JS1
6"
BHD 23
FOR CONT
SEE REF #8
FOR CONT
SEE REF
FR 22
"C"
P2-¾"
P2-¾"
"C"
V-1299
Ⓑ
FR 21
SHELL AT
22'-0" LVL
℄ SHIP
FWD

PLAN BEL 33'-0" LEVEL

6302.54

MICRO-MASTER 105 mm

K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

® Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME 2

10X

6302.55

CSD VAULT

E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 2-26-79
SIGNED

YARD PRINTS | ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS							
REV.	D	D	A	C	A	D
SHEET	1	2	3	4	5	6

GROUP
MC NO.

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	NO

NNS&DDCO HULL No.	MARAD HULL No.	USMA DESIGN
615C 311 614C 310 613C 309		T11-S-116d

SHIP'S NAME

APPROVALS
OWNERS
ABS
USCG NR

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING

INSTALLATION GROUP 6302-0106-1001SI
6302-0106-1002SI

ARR DWG 6302-54

SCALE NONE =1 Ft.
DRAWN D.L. HOFFMAN
CHECKED T.E. SEAMAN
SECT. MGR. J.H. Johnson
DATE COMPL. 7-14-76
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 7-14-76
TECH. APPROVAL NR
CSD APPROVAL R. L. Hannington

GROUPED | CHK. | BY
DATES | COMP. | PART
HULL 613C | GROUP NO. | KEY
TYPE OF DWG. —

TITLE
PIPING ARR MAIN SHAFT LUBE OIL SYS LIST OF MAT'L

DWG. NO. 6302-55 | REV D | SHEET NO. 1 OF 6

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE RJP	7/14/76	JHJ	—	—
B	4 6	LINES 5-8 & 12 CHG'D S/M ADDED LINE 14, 15 & 16 REC TES LINES 10 & 11 CHG'D S/M	4/16/7	AC JHJ		
C	4	ADDED LINE 18 LAM	12/13/7	AC JHJ		
D	6	QTY OF L'S 1,8,10,12 & 13 WAS 50'-0", 4, 8, 2 & 1 RESPECT. (WORK ACCOMP ON 613C BY LIAISON NO. 613C-JHJ-113.)	2/26/9	JHJ		

GENERAL NOTES

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF #1

NO.	REFERENCES	DWG. NO.
1	DIAG MN LO SYSTEM - LIST OF MAT'L	6200-610

HULL NO. 613C, 614C, 615C | DWG. NO. 6302-55
REV D | SHEET 2 OF —

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	350'	P1	1¼" IPS x STD THK STL PIPE	K57-06-105	ST-PS	
		2	65'0"	P2	¾" IPS x X HVY THK STL PIPE	K57-07-103		
		3	40'0"	P3	½" IPS x XHVY THK STL PIPE	K57-07-102		
		4	18'0"	P4	¼" IPS x XHVY THK STL PIPE	K57-07-100		
		5	6'	P5	⅜ IPS x XHVY THK STL PIPE	K57-07-101		
		6						
		7	5	12ES1	1¼" ELL 90° SW STL 3000#	25-60-009	ST-PS	
		8	2	6ES1	¾"	25-60-007		
		9	2	4ES1	½"	PO ③ 6200-M12	MD-PS	
		10	2	12CS1	1¼" COUPLING SW 3000# CARB STL	⑲		
		11	7	6CS1	¾"	25-60-053	ST-PS	
		12	4	4CS1	½"	PO ⑯ 6200-M12	MD-PS	
		13	2	2CS1	¼"	⑮		
		14	1	4US1	½" UNION SW STL 3000#	PO ② 6950-C11		
		15	1	F1	1¼x1¼x¼ TEE RED 3000# S.W. STL	25-60-253	ST-PS	
		16	2	4D1	½" DECK SLEEVE STL ③ 216522	25-20-174		
		17	3	6D1	¾" ④	25-20-176		
		18	2	6US1	¾" UNION S.W. STL 3000#	PO ③ 6950-C11	MD-PS	

REMARKS -

SERVICE - MN SHAFT L.O. SYS
MC.NO. PS-168
GROUP NO. 6302-0106-1001SI SHT 1 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6302-55 | SHEET 3 | REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	34BRS1	2"x½" BUSHING RED. SW CARB. STL 3000#	PO ㉜ 6200-M12	MD-PS	
		2	1	23BRS1	1¼x½" BUSHING RED SW CARB STL 3000#	25-60-375	ST-PS	
		3	1	22BRS1	1¼x⅜" BUSHING RED. SW CARB STL 3000#	25-60-374 25-60-365		
		4	1	12TS1	1¼" TEE SW CARB STL 3000#	25-60-080		
B		5	5	H-1	1¼" FIXED HANGER NO LINER	25-40-352		
B		6	10	H-1	¾"	25-40-332		
B		7	8	H-1	½"	25-40-322		
B		8	3	H-1	¼"	25-40-302		
		9						
		10						
		11	1	20JS1	2" FLG 150# SLIP-ON CARB. STL	PO ① 6450-C37	MD-PS	
		12	6	12JS1	1¼" FLG 150# SLIP-ON CARB. STL	㊷		
		13						
B		14	1	V1299	¾" GLOBE SW 600# STL	3/ 26-09-276	ST-PS	
B		15	1	F-2	¾" TEE 3000# SW STL	PO ⑪ 6200-M12	MD-PS	
B		16	1	F-3	¾" PIPE CAP M.I GALV SCRD	3/ 25-06-176	ST-PS	
		17						
C		18	1	①	1¼" CHK VALVE STL, SW, 600#	READY MAT'L NO. V-0946-88-015	ST-PS	

REMARKS -

SERVICE - MN SHAFT L.O. SYS
MC.NO. PS-168
GROUP NO. 6302-0106-1001SI SHT 2 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6302-55 | SHEET 4 | REV. B

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	12	12Z1	1¼"	BOLTS	½" HVY HEX HD STL L=2¼"	6000-C7 ㉛	MD-PS	
	2	12			NUTS	½" HVY HEX STL	6000 C11 ①		
	3	3			GSKT	1/16" COMP ASBESTOS	15-01-266 E	ST-PS	
	4	4	20Z1	2"	BOLTS	⅝" HVY HEX HD STL L=2½"	6000-C7 ㉗	MD-PS	
	5	4			NUTS	⅝" HVY HEX STL	6000-C11 ②		
	6	1			GSKT	1/16" COMP ASBESTOS	15-01-270 E	ST-PS	
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - MN SHAFT L.O. SYS
MC.NO. PS-168
GROUP NO. 6302-0106-1001SI SHT 3 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6302-55 | SHEET 5 | REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D		1	90'0"	P2	¾" IPS X X-HVY THK STL PIPE	K57-07-103	PS	
		2	135'0"	P3	½" IPS X X-HVY THK STL PIPE	K57-07-102		
		3						
		4						
		5	1	29BRN1	1½" x ¾" THD BUSHING 150# M.I.	25-05-244	ST-PS	
		6	1	F2	1½" AIR ESCAPE VALVE CARB. STL SCRD	PO ① 6200-C14	MD-PS	
		7	2	6US1	¾" UNION SW CARB. STL	PO ③ 6950-C11		
D		8	4 6	6CS1	¾" COUPLING SW 3000# CARB STL	25-60-053	ST-PS	
		9	12	4CS1	½" COUPLING SW 3000# CARB. STL	25-60-052		
D		10	8 10	H-1	¾" FIXED HANGER NO LINER	25-40-332		
B		11	20	H-1	½"	25-40-322		
D		12	2 4	4D1	½" DK SLEEVE STL ③ 216522	25-20-174		
D		13	1 3	6D1	¾" ④	25-20-176		
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - MN SHAFT L.O. SYS
MC.NO. PS-178
GROUP NO. 6302-0106-1002SI SHT 1 OF 1
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6302-55 | SHEET 6 | REV. D

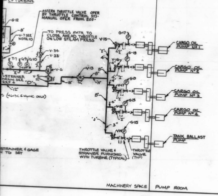
6302-55

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X


LP TURBINE
G-12
8"
V-7 SEE NOTE 10
"F"
ASTERN THROTTLE VALVE OPER BY THROTTLE CONTROL SYS-MANUAL OPER FROM EOS-
TO PRESS XMTR TO CLOSE AHEAD THROTTLE ON LOW STEAM PRESS
V-34
V-33
T-7
G-9
G-10
"E"
12"
V-6
STRAINER DRAIN SEE REF 4
V-5
12"
"D"
12"
S (H613C & H614C ONLY)
V-13
8"
"H"
8"
V-15
G-17
"I"
4"
V-16
G-19
4"
8"
G-21
V-17
4"
"I"
8"
G-23
V-18
"I"
"J"
3"
G-15
V-14
CARGO OIL PUMP Nº 1
CARGO OIL PUMP Nº 2
CARGO OIL PUMP Nº 3
CARGO OIL PUMP Nº 4
TANK BALLAST PUMP
STRAINER & GAGE
H TG SET
THROTTLE VALVE & STRAINER FURNISHED WITH TURBINE (TYPICAL)
THROTTLE VALVE (TYP)
MACHINERY SPACE
PUMP ROOM

SYMBOL	DESCRIPTION
⊣¦⊢	ORIFICE FOR MEASURING FLOW
	FLOW CONTROL VALVE
	PNEUMATIC OPERATED VALVE
----	PIPING SHOWN THUS FURN W/UNIT
Ⓟ▲	DIST READING PRESS GAGE (LOC IN CARGO CONT RM)
	ELECTRIC OPER SAFETY VALVE
	MOTOR OPER GATE VALVE
—Ⓟ	PRESSURE GAGE (LOCAL)
—Ⓣ△	DIST READING THERM (LOC AT LOCAL BURNER CONT STA)
—Ⓟ△	DIST READING PRESS GAGE (LOC AT LOCAL BURNER CONT STA)
	RING & BLANK FLANGE
	STOP CHECK VALVE
	MOTOR OPERATED STOP VALVE
—Ⓣ●	DIST READING THERM (LOC IN EOS)
—Ⓟ●	DIST READING PRESS GAGE (LOC IN EOS)
	THERMOMETER (LOCAL)
	ANGLE STOP CHECK VALVE
	ANGLE VALVE
⊳⊲	STOP VALVE
	GATE VALVE
	STEAM STRAINER
	SAFETY VALVE

SYMBOL LIST

DIAGRAM MAIN STEAM
AND SUPERHEATED AUXILIARY
STEAM SYSTEM ARR

NN CO. #	REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH'D	OWNER DATE	OWNER APPD
—	A	—	INITIAL ISSUE.	9/17/74	JMY	—	—
613C 56	B	—	ADDED PRESSURE SWITCH AND ASSOCIATED PIPING AT TURBO GENERATOR FOR H613C & H614C ONLY.				
—		—	ARRANGEMENT OF CARGO AND BALLAST PUMP TURBINES AND ASSOCIATED PIPING ALTERED TO SUIT SHIPS ARRANGEMENT. RBW	11/11/75	JMY	—	—
613C 78	C		TG RATING FOR HULL 613C & 614C WAS 2000 KW				
613C 48			ADDED LOCAL GAGE G25 & G26 FOR MN TURBINE 1ST STAGE & ASTERN ST RESP (H-613C & 614C).			—	—
—			ASTERN ST LINE WAS 10" CUT OUT VALVES FOR V45 & V46 WERE GLOBE STOP. ADDED BLR REL V55 & V56 AND PRESS CONT SWITCH FOR V46 & V45	5/17/76	JMY		
	D		DELETED G-13 & T-8. SEE G-112, G-113 & T-35 ON DWG 613C-6451-472				
			DELETED ½" LINES TO STM PRESS XMTRS & STM TEMP XMTRS. DELETED V57 & V-60. DELETED PS TO START AUX DIES GEN & V-39 & V40 DELETED G-14, G-16, G-18, G-20 & G-22. GER				
			PRESSURE SWITCHES FOR V-45 TO V-46 TO TAKE SENSING FROM BOILER DRUM INSTEAD OF STEAM MAIN	1/25/77	JMY		

~~AUTHORITY:~~

~~GENERAL NOTES:~~

FOR LIST OF MAT'L, NOTES & REF
SEE NN DWG 6440-506

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIVISION
FSCM NO. 43689
MACHINERY DEPT.

SCALE NONE = 1 FT
DRAWN RB WEISS
CHECKED H.M. EDGE
SECT MGR J.K. Johnson
DATE COMPL. 9-17-74
EXAMINED
AUTHORIZED EB
DATE 9-17-74
TECH APPROVAL
CSD APPROVAL J. R. Thurstead

DIAGRAM OF MAIN STEAM AND SUPERHEATED AUXILIARY STM SYS ARRANGEMENT

USMA DESIGN T11-S-116a
~~USMA DWG NO.~~
~~HULL NO.~~
DWG NO. 6440-505
REV D
SHEET NO. 1 OF 1

NO.	REFERENCES	DWG NO.

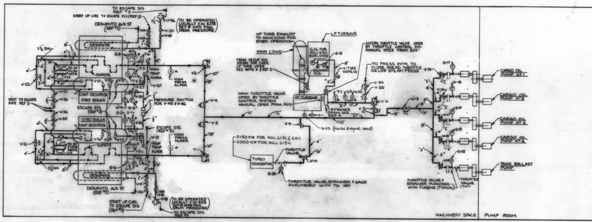
REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 5-25-9 SIGNED J H Johnson
YARD PRINTS
ORDERED BY DESIGN
GROUP:
MC NO.

DWG. REV — HULL APPLIC

REV	NN HULLS ONLY		
A	YES	YES	YES
B	YES	YES	YES
C	Yes	Yes	Yes
D	YES	YES	YES

6440.505

SEPT. '80
FRAME 1
10X


TO ESCAPE SYS REF #3
START UP CIRC TO ESCAPE SYS (REF 3)
DESUPHTD AUX ST (REF #2)
V-46
V-50
V-49
V-44
V-43
(TO BE OPERATED LOCALLY & IN EOS SET @ 1045 PSIG DRUM PRESSURE)
DESUPHTR
3 1/8" DIA
8"
6"
"A"
TO ST FLOW XMTR
V23
V24
SUPHTR
G-8
G-7
T-6
T-3
T-4
HIGH TEMP ALARM
HIGH PRESS ALARM
V-2
10"
"B"
V-22
V-37
V-38
VENT TO ESCAPE PIPE REF 3
V-55
V-32
V-31
V-27
V-28
V-20
CONT DESUPHTR
PORT BOILER
PRESSURE SWITCH FOR V-45 & V-46
V-4
ESCAPE SYS (REF #3)
G-4
G-3
G-2
G-1
V-36
V-35
STBD BOILER
CONT DESUPHTR
V-26
V-25
V-3
V-19
V-56
V-30
V-29
T-2
T-1
V-21
V51
V52
V53
V54
V-1
G-6
G-5
T-5
"K"
V-41
V-42
V-47
V-48
V-45
START UP CIRC TO ESCAPE SYS (REF #3)
(TO BE OPERATED LOCALLY & IN EOS SET @ 1045 PSIG DRUM PRESSURE)
TO ESCAPE SYS REF #3
HP TURB EXHAUST TO MAIN COND FOR EMER OPERATION
LP TURBINE
MAIN COND
G-26 FOR HULL 613C & 614C ONLY
G-12
BLANKED FLG
FROM DESUP AUX STEAM FOR EMER LP TURB. OPER SEE NOTE 9 & REF 2
ASTERN THROTTLE VALVE OPER BY THROTTLE CONTROL SYS-MANUAL OPER FROM EOS-
V-7 SEE NOTE 10
"F"
TO PRESS XMTR TO CLOSE AHEAD THROTTLE ON LOW STEAM PRESS
V-34
V-33
MAIN THROTTLE VALVE OPER BY THROTTLE CONTROL SYSTEM MANUAL OPER FROM EOS
HP TURBINE
T-7
G-9
G-10
"E"
12"
STRAINER DRAIN SEE REF 4
V-6
V-5
"D"
"C"
G-11
V9
G-25 (H613C & H614C ONLY)
V-13
"H"
2150 KW FOR HULL 613C & 614C
2000 KW FOR HULL 615C
TURBO GENERATOR
THROTTLE VALVE
V10
"G"
4"
G-24
THROTTLE VALVE, STRAINER & GAGE FURNISHED WITH TG SET
V-15
G-17
"I"
V-16
G-19
V-17
G-21
V-18
G-23
"J"
3"
V-14
G-15
CARGO OIL PUMP No 1
CARGO OIL PUMP No 2
CARGO OIL PUMP No 3
CARGO OIL PUMP No 4
TANK BALLAST PUMP
THROTTLE VALVE & STRAINER FURNISHED WITH TURBINE (TYPICAL)
THROTTLE VALVE (TYP)
MACHINERY SPACE
PUMP ROOM

SYMBOL	DESCRIPTION
─┤├─	ORIFICE FOR MEASURING FLOW
─⋈─	FLOW CONTROL VALVE
─⋈─	PNEUMATIC OPERATED VALVE
─ ─ ─	PIPING SHOWN THUS FURN W/UNIT
Ⓟ▲	DIST READING PRESS GAGE (LOC IN CARGO CONT RM)
⋈	ELECTRIC OPER SAFETY VALVE
─⋈─	MOTOR OPER. GATE VALVE
─Ⓟ	PRESSURE GAGE (LOCAL)
─Ⓣ△	DIST READING THERM (LOC AT LOCAL BURNER CONT STA)
─Ⓟ△	DIST READING PRESS GAGE (LOC AT LOCAL BURNER CONT STA)
─┤├─	RING & BLANK FLANGE
─⋈─	STOP CHECK VALVE
─⋈─	MOTOR OPERATED STOP VALVE
─Ⓣ*	DIST READING THERM (LOC IN EOS)
─Ⓟ*	DIST READING PRESS GAGE (LOC IN EOS)
─▭	THERMOMETER (LOCAL)
⋈	ANGLE STOP CHECK VALVE
⋈	ANGLE VALVE
─⋈─	STOP VALVE
─⋈─	GATE VALVE
⊟	STEAM STRAINER
⊗	SAFETY VALVE

SYMBOL LIST

6440.505

MICRO-MASTER 105 mm
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SEPT. '80
FRAME 2
10X

6440-506

CSD [redacted] VAULT X182

REVISIONS						
REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APP'D.
—	—	SEE SHEET 2	—	—	—	—

REV. STATUS OF SHEETS											
REV.	D	D	A	A	C	C	D	D	D	C	D
SHEET	1	2	3	4	5	6	7	8	9	10	8A

REV.

SHEET

GROUP

MC NO.

FOR ARR. SEE N.N. DWG. NO. 6440-505

DWG. REV.—HULL APPLIC.

REV.	NN HULLS ONLY 613C	614C	615C		
A	YES	YES	YES		
B	YES	YES	YES		
C	YES	YES	YES		
D	YES	YES	NO		

NNS & DD Co. HULL NO.	MARAD HULL NO.	USMA DESIGN	SHIP'S NAME
615C	311		
614C	310		
613C	309	T11-S-116a	

APPROVALS

OWNERS

ABS

USCG

Newport News Shipbuilding
A Tenneco Company

TENNECO

Commercial Ship Division

FSCM NO. 43689

DESIGN DIVISION — MACHINERY DEPT

REPRODUCTION OFFICE

YARD PRINTS YES GROUPING NO

REMARKS

DATE 1-25-79 SIGNED J H Johnson

SPECIAL PRINTS: P 18 SHS

REV.	DATE ISSUED
	11-19-75
C	5-19-76
D	1-31-79

YARD PRINTS

FIRST ISSUE	DEPT.	NO. PRINTS
	AH	
	BL	
	BR	
	EL	
	FP	
1-31-79	MI	4
	ML	
	MS	
	PC	
	PM	
1-31-79	PS	12
	PN	
	RD	
	RM	
	MR	
	SH	
	SM	
	TM	
	WD	
	WE	
	WM	
	X16	

ORDERED BY DESIGN

FIRST ISSUE	DEPT.	NO. PRINTS
5-19-76	SEPIA/RO	1
	JHJ	1
	JEA	1
	RGH	1
	E11	1
	E34	1
	[illegible]	1
	KSO	1
	CSD-V	1
	D.R./SHELL	2
	USCG/LUXAUL	2
1-31-79	ABS	2

GROUPED BY — CHK.

DATES COMP. — PART

HULL — KEY — GROUP NO.

TYPE OF DWG.

SCALE: NONE = 1 Ft.
DRAWN: L.A. MCNEIL
CHECKED: H.M. EDGE
SECT. MGR. J H Johnson

DATE COMPL. 9-17-74
EXAMINED: EBT
AUTHORIZED: EBT
DATE 9-17-74

TECH. APPROVAL SAW 9/17/74 9-17-74 9-17-74

CSD APPROVAL J. R. Thinehead

TITLE
DIAGRAM MAIN STEAM AND SUPERHEATED AUX STEAM SYSTEM LIST OF MAT'L

DWG. NO. 6440-506 — REVISION D — SHEET NO. 1 OF 10

M7 11 X 17

6440-506

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REVISIONS

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		OWNER	
NN	OWNER					DATE	AUTHD	DATE	APPD
☒	☒	A	-	-	INITIAL ISSUE				—
—	—	B	6	-	V9 WAS GATE. V10 WAS GLOBE STOP. V11 & V12 ADDED.	11/12/75		—	—
-	-		7	-	V21 & V22 WERE BUTT WELD. V23 & V24 ADDED.				
613C #56	—		8	-	V39 & V40 ADDED.				
—	—		8	-	V51, V52, V53 & V54 ADDED.				
—	—		8	-	V35 THRU V38 WERE CHROME MOLY. RBW				
#78	—	C	10	-	ALT ST FLOW & VEL TO TG FOR H-613C & 614C	5/17/76			
#48			9	-	ADD GAGE G25 & G26 FOR H-613C & 614C				
			6	-	V19 & V20 SIZE ADDED & SET WAS 10". V7 WAS 10"				
			7	-	V29 & V31 SET WAS 1050. V21 & V22 SIZE ADDED				
			8	-	V45 & V46 SET PRESS ADDED				
			8A	-	ADDED				
			10	-	DESIGN CHARACTERISTICS 1055 PSIG WAS 1050 PSIG, 553°F DESIGN TEMP. WAS 552°F, 1583 HYDRO WAS 1575 & REQ'D DESIGN PRESS 942 WAS 937. ALL TO SUIT DESIGN DEV. H.M.E				
			5,10	-	ADD: "BET V21 & V22 AND DESUPHTR"				
		D	9	-	DELETED G-13 & T-8. SEE G-112, G-113 & T-35 ON DWG 613C-6451-472. WDB	1/25/9			
			7	-	ALT'D SERVICE FOR V-25, V-26, V-27, V-28				
			8A	-	DELETED V-57 & V-60				
			8A	-	ALT'D BODY MAT'L & MAT'L SPEC FOR V-58, V-59, V-61, & V-62 GEIC				
			8	-	DELETED V-39 & V-40				
			9	-	DELETED G-14, G-16, G-18, G-20, & G-22. GER				
			7 8A	-	ALT'D BODY MAT'L FOR V-25, V-26, V-27 & V-28. DELETED V-58, V-59, V-61, & V-62. ERS				

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		OWNER	
NN	OWNER					DATE	AUTHD	DATE	APPD

DIAG MN ST AND SUPHT AUX ST SYS - LIST	HULL NO. 613C, 614C, 615C	DWG. NO. 6440-506	REV. D
			SHEET 2

K&E 19 1253 10-71 2236•

MN11-11 X 17 (REV. 1)

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2	REVISIONS
3	TABLE OF CONTENTS
4	GENERAL NOTES
5	MATERIAL SCHEDULE
6,7,8	VALVE LIST
9	INSTRUMENT LIST
10	DESIGN CHARACTERISTICS & FLOW DATA TABLE

REFERENCES

NO.	TITLE		DWG NO.
1	CONTRACT GUIDANCE DIAG OF MN ST SYS		216559
2	DIAG DESUP AUX ST SYS - ARR		6450-683
3	DIAG AUX EXH, BLEED ST & RELIEF VALVE ESCAPE - ARR		6451-471
4	DIAG DRAIN COLL SYS - ARR		6555-464
5	TYP ARR OF GAGE PIPING		6750-481
6	DIRECTIONS FOR INSULATING & LAGGING OF PIPES & AUX IN E.R.		257322
7	PP ARR MISC INSTRUMENTS IN ENGRM		6755-67

HULL NO. 613C,614C,615C	DWG. NO. 6440-506	REV. A
DIAG MN ST AND SUPHT AUX ST SYS - LIST		SHEET 3

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MN12-11 X 17 (REV. 1)

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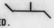
GENERAL NOTES

1. ALL PIPE SIZES SPECIFIED ARE NOMINAL I.P.S. DIAMETER.
2. ALL PIPE, VALVES AND FITTINGS ARE TO MEET THE REQUIREMENTS OF U.S. COAST GUARD AND THE AMERICAN BUREAU OF SHIPPING.
3. PROVISION FOR EXPANSION IN ALL PIPES TO BE MADE WITHOUT THE USE OF EXPANSION JOINTS.
4. FLANGES FOR MAIN STEAM TO BE USED ONLY AS REQUIRED AND WHERE ATTACHED TO TURBINE AND EQUIPMENT. LINE JOINTS TO BE WELDED USING BACKING RINGS.
5. CONTROL AND INSTRUMENT PIPING LED FROM SUPERHEATED STEAM LINES SHALL BE ARRANGED TO PRECLUDE CONDENSATE FROM ENTERING THE SUPERHEATED STEAM LINE IN ORDER TO PREVENT CRACKING DUE TO THERMAL SHOCK.
6. VALVES MARKED THUS ON FACE OF PLAN SHALL BE INSTALLED AS FOLLOWS

FLUID ON THIS SIDE IS
ISOLATED FROM STEM
PACKING WITH VALVE CLOSED.



FLUID ON THIS SIDE IS
IN CONTACT WITH STEM
PACKING WITH VALVE CLOSED.

7. GAGE PIPING TO BE IN ACCORDANCE WITH REF.5.
8. INSULATION AND LAGGING REQUIREMENTS SHALL BE IN ACCORDANCE WITH REF.6.
9. PIPING FOR EMERGENCY L.P. TURBINE OPERATION SHALL BE MADE PORTABLE AND STOWED IN A CONVENIENT LOCATION.
10. PNEUMATIC OPERATED ASTERN GUARDIAN VALVE FURNISHED WITH THE MAIN TURBINES SHALL BE OPERATED BY THE CENTRALIZED CONTROL SYSTEM AS INDICATED ON REFERENCE #7 AND SHALL ALSO HAVE PUSHBUTTONS AND POSITION INDICATOR LIGHTS ON THE MAIN CONSOLE.
11. MOTOR OPERATED STEAM SUPPLY VALVE FOR THE SHIP SERVICE TURBINE GENERATOR SET SHALL BE OPERATED BY THE CENTRALIZED CONTROL SYSTEM AS INDICATED ON REFERENCE #7 AND SHALL HAVE POSITION INDICATOR LIGHTS ON THE MAIN CONSOLE.
12. ORDERED THICKNESS OF PIPE INCLUDES AN ALLOWANCE FOR BENDING TO A MINIMUM RADIUS OF 5 IPS DIAMETERS.
13. THIS THICKNESS IS THE MINIMUM THICKNESS ALLOWABLE AFTER ALL PIPE END PREPARATION IS COMPLETED AND IS IN ACCORDANCE WITH U.S. COAST GUARD MINIMUM THICKNESS REQUIREMENTS.
14. VALVES REFERRING TO THIS NOTE HAVE VALVED BYPASSES FURNISHED WITH THE MAIN VALVE. BYPASS VALVES AND PIPING SHALL MEET ALL THE REQUIREMENTS OF THE SYSTEM IN WHICH THEY ARE INSTALLED.
15. ALL MOTOR OPERATED VALVES SHALL HAVE HANDWHEELS FOR LOCAL MANUAL CONTROL.

HULL NO. 613C, 614C, 615C	**DWG NO.** 6440-506	**REV.** A
DIAG MN ST AND SUPHT AUX ST SYS – LIST		**SHEET** 4

K&E 191253 5-74 W2847A+

MN 13-11X17 (REV. 1)

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MATERIAL SCHEDULE

SERVICE	ITEM	TYPE	SIZE	MATERIAL	APPLICABLE DOCUMENTS
	PIPING	SEAMLESS	ALL	1-1/4CR-1/2 MO STEEL	ASTM A-335-73 GR P11
BOILER PRESS SUPHTD ST INCLUDING SUPHTD ST HOR TO DESUPHTR INLET, CONTROL DESUPHTR AND GAGE PIPING.	FITTINGS	FLANGED	2-1/2" & ABV	CAST 1-1/4CR-1/2 MO STL	ANSI B16.5-73 900# ASTM A-217-70, GR WC-6
		BUTT WELDING	↓	FORGED 1-1/4CR-1/2 MO STL	ANSI B16.9-71 ASTM A-234-71
		SOCKET WELDING	2" & BEL	↓	ANSI B16.11-73 3000# ASTM A-234-71
	JOINTS	FLANGED WELDING NECK	2-1/2" & ABV	↓	ANSI B16.5-73 900# ASTM A-182-71, GR F-11
		FLANGED SOCKET WELDING	2" & BEL	↓	↓
	GASKETS	SPIRAL WOUND	ALL	METALLIC ASBESTOS STAINLESS STEEL	900# FLEXITALLIC STYLE CG OR EQUAL
	FLANGE BOLTING	BOLT STUDS	↓	ALLOY STEEL	ASTM A-193-74, GR B16 OR EQUAL
		NUTS HVY HEX	↓	STEEL	ASTM A-194-73 GR 7 OR EQUAL
BOILER PRESS SATURATED ST FROM ST DRUM TO SUPHTR INLET BETWEEN V-21 & V-22 AND DESUPHTR	PIPING	SEAMLESS	ALL	CARBON STEEL	ASTM A-53-73 GR B
	FITTINGS	FLANGED	2-1/2" & ABV	CAST CARBON STEEL	ANSI B16.5-73 600# ASTM A-216-74, GR WCB
		BUTT WELDING		FORGED CARBON STEEL	ANSI B16.9-71 ASTM A-234-71
		SOCKET WELDING	2" & BEL	↓	ANSI B16.11-73 3000# ASTM A-234-71
	JOINTS	FLANGED WELDING NECK	2-1/2" & ABV	↓	ANSI B16.5-73 600# ASTM A-105-71
		FLANGED SOCKET WELDING	2" & BEL	↓	↓
	GASKETS	SPIRAL WOUND	ALL	METALLIC ASBESTOS STAINLESS STEEL	600# FLEXATALLIC, CG OR EQUAL
	FLANGE BOLTING	BOLT STUDS	↓	ALLOY STEEL	ASTM A-193-74, GR B16 OR EQUAL
		NUTS HVY HEX	↓	STEEL	ASTM A-194-73 GR 7 OR EQUAL

REMARKS

PIPE LIST

NOM SIZE	CAL MIN THK *	ORDERED THK***	SCHEDULE
12"	.653"	.705" MIN **	80 **
10"	.550"	.595" MIN **	80 **
8"	.442"	.477" MIN **	80 **
5"	.285"	.375" NOM	80
4"	.231"	.337" NOM	80
3"	.244"	.300" NOM	80
1/2"	.108"	.147" NOM	80
CONTROL DESUPHTR			
4"	.196"	.337"	80
5"	.242"	.375"	80
8"	.376"	.500"	80

* SEE NOTE 13
** TO BE ORDERED MIN THK
*** SEE NOTE 12

PIPE LIST

NOM SIZE	CAL MIN THK *	ORDERED THK***	SCHEDULE
6"	.280"	.432" NOM	80
1/2"	.101"	.147" NOM	80

* SEE NOTE 13
*** SEE NOTE 12

HULL NO. 613C, 614C, 615C	DWG. NO.	6440-506
	REV. C	SHEET 5 OF

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VALVE LIST

REV	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V-1	1	10"	ANGLE STOP CHECK	CAST 1-1/4CR-1/2 MO STL	900#	BW ANSI B16.25	SEE NOTE * BELOW	MN ST-STBD BLR SUPHTR OUTLET	SEE NOTE #14	ASTM A217=70 GR WC-6
	V-2	1	10"	↓ ↓ ↓					PORT		
	V-3	1	10"	GATE					STBD		
	V-4	1	10"						PORT ↓ ↓ ↓		
	V-5	1	12"	↓					TO MN TURB		
	V-6	1	12"	ANGLE STOP					TO MN TURB	↓	
	V-7	1	8"	GLOBE STOP					ASTERN GUARDIAN	PNEU OPER-FURN WITH MN TURB - SEE NOTE #10	
	V-9	1	4"	ANGLE STOP					TO TG ROOT		
	V-10	1	4"	↓ ↓	↓		↓		TO TG CUTOUT	MOTOR OPER SEE NOTE #11	↓
B	V-11	1	½"	GLOBE STOP	FORGED CARBON STL		SW ANSI B16.11		FLOW TRANSMITTER CUTOUT		ASTM -A 181
B	V-12	1	½"	↓ ↓	↓		↓		↓ ↓ ↓		↓
	V-13	1	8"	GATE	CAST 1¼ CR-½ MO STL		BW ANSI B16.25		TO CARGO & BALL PUMP TURBINES	SEE NOTE #14	ASTM A217-70 GR WC-6
	V-14	1	3"	ANGLE STOP					BALLAST PUMP TURB CUTOUT		
	V-15	1	4"						CARGO PUMP NO.1 TURB CUTOUT		
	V-16	1	4"						CARGO PUMP NO.2 TURB CUTOUT		
	V-17	1	4"						CARGO PUMP NO.3 TURB CUTOUT		
	V-18	1	4"	↓			↓		↓ CARGO PUMP NO.4 TURB CUTOUT		
C	V-19	1	2½x4	PILOT OPER SAFETY			FLG ANSI B16.5		STBD BLR SUPHTR SAFETY VALVE	FURN W/BLR. SET AT 1055 PSIG DRUM PRESS	
C	V-20	1	2½"x4"	↓ ↓ ↓	↓	↓	↓	↓	↓ ↓ PORT ↓ ↓ ↓ ↓	↓	↓

* STAINLESS STEEL AISI 410 OR AISI 416 WITH STELLITE FACED CR-MO STEEL SEAT & DISC

HULL NO. 613C, 614C, 615C	DWG. NO. 6440-506	
	REV. C	SHEET 6 OF

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VALVE LIST

REV.	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
C	V-21	1	4"	FLOW CONTROL	CAST 1-1/4CR-1/2 MO STEEL	900#	FLG'D 900 #	SEE NOTE * BELOW	MN ST STBD BLR CONT DESUPHTR CONT VLV	FAIL OPEN	ASTM A-217-70 GR WC-6
C	V-22	1	4"	↓ ↓	↓	↓	↓	↓	↓ ↓ PORT ↓ ↓ ↓ ↓ ↓	↓	↓
B	V-23	1	½"	GLOBE STOP	FORGED CARBON STL	↓	SW ANSI B16.11	↓	↓ ↓ FLOW TRANSMITTER CUTOUT		ASTM-A 181
B	V-24	1	½"	↓ ↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓		↓
D	V-25	1	1/2"	GLOBE STOP	↓	↓	SW ANSI B16.11	↓	↓ ↓ V-45 CONT SWITCH C.O.		ASTM- A182 GR F-11
D	V-26	1	1/2"	↓ ↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ ↓		↓
D	V-27	1	1/2"	↓ ↓	↓	↓	↓	↓	↓ ↓ V-46 ↓ ↓ ↓		↓
D	V-28	1	1/2"	↓ ↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ ↓		↓
C	V-29	1	1½x2½"	ANGLE SAFETY	CAST CARBON STL	↓	FLG ANSI B16.5	↓	↓ ↓ STBD BLR DRUM PILOT SAFETY VLV	FURN WITH BOILER SET AT 1055 PSIG	ASTM-A 216 GR WCB
	V-30	1	2½x4"	↓ ↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ ↓ ↓	↓ SET AT 1075 PSIG	↓
C	V-31	1	1½x2½"	↓ ↓	↓	↓	↓	↓	↓ ↓ PORT ↓ ↓ PILOT ↓ ↓	↓ SET AT 1055 PSIG	↓
	V-32	1	2½x4"	↓ ↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ ↓ ↓	↓ SET AT 1075 PSIG	↓

* STAINLESS STEEL AISI 410 OR AISI 416 WITH STELLITE FACED CR-MO STEEL SEAT & DISC

HULL NO. 613C, 614C, 615C	DWG. NO. 6440-506
	REV. D SHEET 7 OF

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V-33	1	1/2"	GLOBE STOP	1-1/4CR-1/2 MO STEEL	900#	SW ANSI B16.11	SEE NOTE * BELOW	MN ST PRESS XMTR CUT OUT		ASTM-A182 GR F-11
	V-34	1	1/2"	↓	↓	↓	↓	↓	↓		↓
	V-35	1	1/2"	↓	FORGED CARBON STL	↓	↓	↓	STBD BLR SAT ST OUT VENT TO ESCAPE		ASTM-A181
	V-36	1	1/2"	↓	↓	↓	↓	↓	↓		↓
	V-37	1	1/2"	↓	↓	↓	↓	↓	PORT		↓
	V-38	1	1/2"	↓	↓	↓	↓	↓	↓		↓
	~~△ V-39~~	~~1~~	~~½"~~	↓	~~1¼ CR ½ MO STL~~	↓	↓	↓	~~PRESSURE SWITCH CUTOUT~~		~~ASTM-A 182 GR F-11~~
	~~△ V-40~~	~~1~~	~~½"~~	↓	↓	↓	↓	↓	↓		↓
	V-41	1	1"	↓	↓	↓	↓	↓	MN ST START UP CIRC TO ESCAPE STBD BLR		↓
	V-42	1	1"	↓	↓	↓	↓	↓	↓		↓
	V-43	1	1"	↓	↓	↓	↓	↓	PORT		↓
	V-44	1	1"	↓	↓	↓	↓	↓	↓		↓
	V-45	1	2½"x4"	ELEC OPER SAFETY	↓	↓	FLGD ANSI B16.5	↓	STBD BLR SPHTR SAFETY (ELEC OPER)	SET AT 1045 PSIG DRUM PRESSURE	ASTM-A 217-70 GR WC 6
	V-46	1	↓	↓	↓	↓	↓	↓	PORT ↓	↓	↓
	V-47	1	2-1/2"	GATE	↓	↓	BW ANSI B16.25	↓	STBD CUTOUT		↓
	V-48	1	↓	↓	↓	↓	↓	↓	↓		↓
	V-49	1	↓	↓	↓	↓	↓	↓	PORT		↓
	V-50	1	↓	↓	↓	↓	↓	↓	↓		↓
	V-51	1	½"	GLOBE STOP	FORGED CARBON STL	↓	SW ANSI B16.11	↓	FLOW TRANSMITTER CUTOUT		ASTM-A-181
	V-52	1	½"	↓	↓	↓	↓	↓	↓		↓
	V-53	1	½"	↓	↓	↓	↓	↓	↓		↓
	V-54	1	½"	↓	↓	↓	↓	↓	↓		↓

* STAINLESS STEEL AISI 410 OR AISI 416 WITH STELLITE FACED CR-MO STEEL SEAT & DISC

△ H613C & H614C ONLY

HULL NO. 613C, 614C, 615C	DWG. NO.	6440-506
	REV: D.	SHEET 8 OF

K&E 19 1253 11-72 2491A•

MN13-11X17

6440-506

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

4X

VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V55	1	$2\frac{1}{2}$"x4"	ANGLE SAFETY	CAST CARBON STL	900#	FLG ANSI B16.5	SEE NOTE * BELOW	PORT BLR DRUM SAFETY VALVE	FURN W/BOILER SET AT 1065 PSIG	ASTM-A216 GR WCB
	V56	1	$2\frac{1}{2}$"x4"	↓ ↓	↓		↓		STBD ↓ ↓ ↓ ↓	↓	↓
D	~~V57~~	1	$\frac{1}{2}$"	~~GLOBE STOP~~	~~1¼ CR-½ MO STEEL~~		SW ANSI B16.11		~~V45 CONT SWITCH CUT OUT~~		~~ASTM-A182~~ GR F11
D	~~V58~~	1	$\frac{1}{2}$"		~~FORGED CARBON STL~~				~~LINE DR~~		~~ASTM-A181~~
D	~~V59~~	1	$\frac{1}{2}$"						↓ ↓ ↓		
D	~~V60~~	1	$\frac{1}{2}$"						~~V46 CUT OUT~~		
D	~~V61~~	1	$\frac{1}{2}$"						~~LINE DR~~		
D	~~V62~~	1	$\frac{1}{2}$"	↓ ↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓		↓

* STAINLESS STEEL AISI 410 OR AISI 416 WITH STELLITE FACED CR-MO STEEL SEAT & DISC

HULL NO. 613C, 614C, 615C	DWG. NO. 6440-506
REV D	SHEET 8A OF

K&E 19 1253 11-72 2491A+

MN13-11X17

6440-506

MICRO-MASTER 105 mm
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4X

INSTRUMENT LIST

INST NO	SERVICE	SIZE	RANGE PSI	
G-1	ST DRUM STBD BLR	–	0-1200	*
G-2	↓	4-1/2"	↓	△
G-3	PORT	–	↓	*
G-4	↓	4-1/2"	↓	△
G-5	SUPHTR OUTLET STBD BLR	–	↓	*
G-6	↓	8-1/2"	↓	△
G-7	PORT	–	↓	*
G-8	↓	8-1/2"	↓	△
G-9	MN ST TO MN TURBINE	4-1/2"	↓	
G-10	↓	–	↓	*
G-11	HP TURBINE 1ST STAGE	–	↓	*
G-12	ASTERN ST INLET & ST CHEST	–	↓	*
~~G-13~~	~~HP LP TURBINE X-OVER~~	~~–~~	~~0-100~~	~~*~~ Ⓓ
~~G-14~~	~~MN ST TO BALLAST PUMP~~	~~4-1/2"~~	~~0-1500~~	▲
G-15	↓	↓	↓	
~~G-16~~	~~CARGO PUMP NO. #1~~	↓	↓	▲
G17	↓	↓	↓	
~~G-18~~	~~#2~~	↓	↓	▲
G-19	↓	↓	↓	
~~G-20~~	~~#3~~	↓	↓	▲
G-21	↓	↓	↓	
~~G-22~~	~~MN ST TO CARGO PUMP #4~~	~~4-1/2"~~	~~0-1500~~	▲
G-23	↓	↓	↓	
G-24	TG	↓	↓	

INST NO	SERVICE	SIZE	RANGE °F	
T-1	MN ST SUPHTR OUTLET STBD BLR	–	400-1200	*
T-2	↓	–	↓	△
T-3	PORT	–	↓	*
T-4	↓	–	↓	△
T-5	STBD	–	↓	
T-6	PORT	–	↓	
T-7	TO MN TURBINE	–	↓	*
~~T-8~~	~~HP LP TURBINE X-OVER~~	~~–~~	~~150-750~~	~~*~~ Ⓓ

	INST NO	SERVICE	SIZE	RANGE
●	G25	H P TURBINE 1ST STAGE	4½	0-1500
●	G26	ASTERN STEAM	↓	↓

* LOCATED IN EOS

△ LOCATED AT BURNER CONT STA

▲ LOCATED IN CARGO CONTROL ROOM

● FOR HULL 613C & 614C ONLY

HULL NO. 613C, 614C, 615C	DWG. NO. 6440-506	
	REV. D	SHEET 9 OF

K&E 19 1253 11-72 2491A•

MN13-11X17

6440-506

MICRO-MASTER® 105 mm

K+E

ARLINGTON • WASHINGTON • BETHESDA
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SEPT. '80

4X

DESIGN CHARACTERISTICS

SERVICE	WORKING PRESS	WORKING TEMP	DESIGN PRESS	DESIGN TEMP	HYDRO TEST PRESSURE
SUPERHEATED MAIN STEAM	850 PSIG	950°F	950 PSIG ▲	950°F	1425 PSIG
SATURATED STEAM TO SUPHTR	965 PSIG	542°F	1055 PSIG	553°F	1583 PSIG
CONT. DESUPHTR EXCEPT BET V21 & V22 & DESUPHTR	933 PSIG	850°F	1055 PSIG	900°F	1583 PSIG
BET V21 & V22 & DESUPHTR	933 PSIG	572°F	1055 PSIG	750°F	1583 PSIG

▲ = DESIGN PRESSURE OF THE SUPERHEATED MAIN STEAM IS BASED ON THE PILOT OPERATED SAFETY VALVE AT THE SUPERHEATER OUTLET SET TO RELIEVE AT 1055 PSIG DRUM PRESSURE. PRESSURE DROP THROUGH THE SUPERHEATER AND ASSOCIATED PIPING IS 113 PSI. IN ACCORDANCE WITH SECTION 56.50-15(b) OF THE U.S.C.G. CODE OF FEDERAL REGULATIONS, THE REQUIRED DESIGN PRESSURE IS 942 PSIG.

FLOW DATA TABLE

SYM	SIZES	FLOW #/HR	VEL FT/SEC	CONDITION	SERVICE
A	6"	158000	112	BOILER RATING	DRUM TO SUPHTR INLET
B	10"	146020	75	ABS POWER	SUPHTR OUTLET TO MN ST HEADER
C	12"	292040	107	ABS POWER	MN ST HEADER TO TG BRANCH
D	12"	280780	103	ABS POWER	MN ST HEADER TO PUMP HEADER
E	12"	280780	103	ABS POWER	SUPPLY TO AHEAD TURBINE
F	10"	280780	149	ABS POWER ASTERN	SUPPLY TO ASTERN TURBINE
G	4"	*(1) 20210, Δ(1) 18800 (2) 11260	*(1) 66, Δ(1) 61 (2) 37	(1) TG RATING (2) ABS POWER	SUPPLY TO TG SET
H	8"	132190	108	PORT PUMPING	MN ST HEADER TO PUMPS
I	4"	30000	97	PUMP RATING	SUPPLY TO CARGO PUMP TURBINE
J	3"	12190	69	PUMP RATING	SUPPLY TO BALLAST PUMP TURBINE
K	6"	(1) 80000 (2) 10305	(1) 116 (2) 15	(1) DESUP RATING (2) ABS POWER	SUPHTR OUTLET TO DESUPHTR

* FOR HULL 613C & 614C
Δ FOR HULL 615C

HULL NO. 613C, 614C, 615C	DWG. NO. 6440-506	REV. C
		SHEET 10

MN 13-11X17 (REV. 1)

6440-506

MICRO-MASTER® 105 mm
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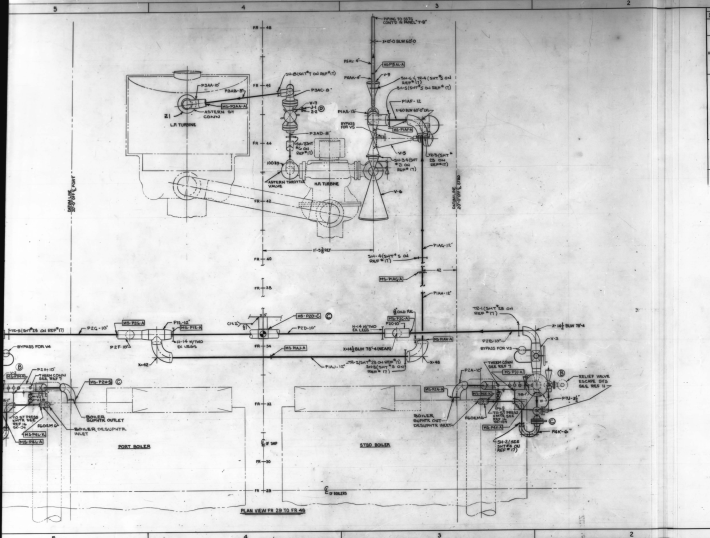
SEPT. '80

4X


5
4
3
2
PIPING TO SSTG CONT'D IN PANEL "7-8"
X=10'-0 BLW 60'-0
FR-48
FR-46
FR-44
FR-42
FR-40
FR-38
FR-34
FR-32
FR-30
FR-29
P5AL-4"
MS-P5AL-A
P5AK-4"
V-9
SH-6 & TR-4 (SHT #5 ON REF #17)
SH-5 (SHT #5 ON REF #17)
SH-8 (SHT #7 ON REF #17)
P3AA-10"
P3AB-8"
P3AC-8"
MS-P3AA-A
ASTERN ST CONN
Z1
L.P. TURBINE
V-7
J-1
Z-2
D
P3AD-8"
SH-7 (SHT #6 ON REF #17)
10089
ASTERN THROTTLE VALVE
H.P. TURBINE
P1AE-12"
P1AF-12
X=60 BLW 60'-0" LVL
BYPASS FOR V5
MS-P1AF-A
V-5
SH-34 (SHT #21 ON REF #17)
TR-3 (SHT #23 ON REF #17)
V-6
DATUM LINE 20'-0" OFF ℄ PORT
DATUM LINE 20'-0" OFF ℄ STBD
11'-5 3/8 REF
P1AG-12"
SH-4 (SHT #5 ON REF #17)
42
MS-P1AG-A
P1AH-12"
TR-5 (SHT #23 ON REF #17)
P2G-10"
MS-P2G-A
P1E-12"
MS-P1E-A
P2F-10"
H-14 W/TWO EX LEGS
X=42
BYPASS FOR V4
CIV.2
1/2
MS-P2D-C
C
P2D-10"
MS-P1AJ-A
P1AJ-12"
3/8" COLD PULL
MS-P2C-A
P2C-10"
H-14 W/TWO EX LEGS
MS-P1AH-A
X=14 1/2 BLW 78'-4 (NEAR)
TR-2 (SHT #23 ON REF #17)
SH-3 (SHT #5 ON REF #17)
X=48
TR-1 (SHT #23 ON REF #17)
X=14 1/2 BLW 78'-4
P2B-10"
V-3
BYPASS FOR V3
B
V-2
MS-P7H-A
P2H-10"
THERM CONN SEE REF 7
MS-P2H-S
C
P9-1/2"
V27
V28
TO ST PRESS XMTR SEE REF 16 SK-134
FGOEMG
MS-P4L-K
MS-P4L-A
BOILER SUPHTR OUTLET
BOILER DESUPHTR INLET
PORT BOILER
℄ OF SHIP
P2A-10"
THERM CONN SEE REF 7
MS-P7J-A
B
RELIEF VALVE ESCAPE SYS SEE REF 11
MS-P2A-A
MS-P4K-K
P8-1"
V1
P7J-2 1/2"
P9-1/2"
TO ST PRESS XMTR SEE REF 16 SK-134
FGOEMG
BOILER SUPHTR OUT
DESUPHTR INLET
MS-P4K-A
C
P4K-6"
SH-2 (SEE SHT #4 ON REF #17)
STBD BOILER
℄ OF BOILERS

PLAN VIEW FR 29 TO FR 48

REVISIONS

N.N. CHANGE ORDER NO.	REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
—	A	ALL	INITIAL ISSUE KRS	[illegible]	JKJ	—	—
—	B	2B 5B 3D	ADDED SPACER BETWEEN V1 & V3; ALSO BETWEEN V2 & V4; AND BETWEEN V5 & V6. KRS				
H-615C-95		ALL	DELETED ALL PORTIONS OF THE DRAWING WHICH WERE APPLICABLE ONLY TO H-615C. WITH THE EXCEPTION OF THE PRESSURE SWITCH CONN ON THE SSTG SUPPLY LINE, ALL PORTIONS WHICH WERE APPLICABLE ONLY TO H-613C & H-614C ARE NOW APPLICABLE TO H-615C AS WELL. KRS	4/15/7	JKJ	—	—
—	C	1A	ALT'D REF #16				
			DELETED P5BJ-4" MADE P5AQ-4" APPLICABLE TO H615C.				
		5-A	ALTERED WELD INDEX NO. FOR PIPING JOINT AT PORT SUPHTR OUTLET CONNECTION, WAS MS-P2H-Q.				
		2-A 5-A	ALTERED P4K-6" & P4L-6" RELOCATING RING & BLANK FLANGE.				
		4-B 11-C	ADDED WELD INDEX NO. FOR P3W-8" & P2D-10" TO ATTACH ANCHOR TO PIPE. WORK ACCOMPLISHED ON 613C.			—	—
			ADDED MS-P5RG FOR H-613C ONLY				
		12-C 12-D	ADDED MS-P5R-H & MS-P5R-A FOR H613C ONLY				
		12-D	MS-P3AL-A WAS MS-P3AL-A MS-P5T-A WAS MS-P5V-A MS-P5Q-B WAS MS-P5Q-A	10/11/7	JKJ		
	D	4-D	ADDED BLIND FLANGE J-1 TO V-7 ABV SEAT DRAIN. (WORK ACCOMPLISHED 613C)			—	—

GENERAL NOTES:

1. THIS PLAN DEVELOPED IN ACCORDANCE WITH REFS Nº 1 & 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD & THE AMERICAN BUREAU OF SHIPPING. SEE REF Nº 2 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S. COAST GUARD, THE A.B.S., & REF Nº 3.
4. ALL BUTT WELDS ARE P3. ALL SOCKET WELDS ARE P14. BOTH TYPES ARE IN ACCORDANCE WITH REF Nº 3 UNLESS OTHERWISE NOTED. SYMBOLS MS1, MS2, ETC INDICATE WELDS REQUIRING STRESS RELIEF AS LISTED ON REF Nº 13.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS, & HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMPS, ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REF Nº 9.
8. TESTS ARE TO BE IN ACCORDANCE WITH REF Nº 2.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REF Nº 5.
10. PIPE HANGERS & TIE RODS INDICATED HEREON ARE TO BE INSTALLED IN ACCORDANCE WITH REF 17.
11. ALL PIPING ON THIS ARRANGEMENT IS CLASS I.
12. BACKING RINGS & COUPLINGS SHOWN IN MATERIAL LIST ARE TO BE USED AS REQUIRED.
13. HANGERS (SH-1, FOR EXAMPLE) AND TIE RODS (SUCH AS TR-1) INDICATED ON PLAN ARE TO BE INSTALLED WITHIN 6" OF POSITION SHOWN.
14. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.

FOR SECTION & ELEVATION VIEWS, SEE DWG Nº 6440-508.

FOR LIST OF MATERIAL, SEE 6440-509.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615	311	
614	310	
613	309	

NO.	REFERENCES	DWG NO.
18	OPR GEAR & EXT STEMS FOR VLVS IN E.R.	267335
17	PIPE HANGERS - MAIN STEAM SYSTEM	6440-531
16	PP ARR MISC INST IN ER	6755-67
15	LIST OF GAGES & THERM FURNISHED BY SUBCONTRACTOR	6750-484
14	PIPING ARR - GLAND SEAL LEAK-OFF & TURBINE DRAIN SYS	6450-700
13	WELD INDEX - MAIN STEAM SYSTEM	6440-526
12	PIPING ARR - HIGH PRESSURE, STEAM DRAINS	6555-475
11	PIPING ARR - RELIEF VALVE ESCAPE SYSTEM - E.R.	6451-468
10	MACH'Y FLAT 60'-0" ABV ℄ FR 23 1/2 - 46 1/2 INBD 38'-0" BHD	1120-66
9	PAINTING SCHEDULE	8300-40
8	MISCELLANEOUS GAGEBOARDS IN ENGINE ROOM	6750-488
7	LIST OF THERMOMETERS FURNISHED BY SHIPYARD	6750-482
6	LIST OF PRESS & VAC GAGES FURNISHED BY SHIPYARD	6750-483
5	TYPICAL ARRANGEMENT OF GAGE PIPING	6750-481
4	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
3	FABRICATION & WELDING INSTRUCTIONS - CL I & 2 PP	257035
2	DIAGRAM - MAIN STEAM SYSTEM - LIST OF MAT'L	6440-506
1	DIAGRAM - MAIN STEAM SYSTEM - ARRANGEMENT	6440-505

APPROVALS

OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689

SCALE 1/2 INCH = 1 FT
DRAWN ANTHONY STARKEY
CHECKED H.M. EDGE
SECT MGR J. K. Johnson
DATE COMPL. 9-19-75
EXAMINED
AUTHORIZED
DATE 9-19-75
TECH APPROVAL 4-6-76
CSD APPROVAL R. L. Hennigh

PIPING ARRANGEMENT
MAIN STEAM SYSTEM
PLAN VIEWS

USMA DESIGN TII-S-1168
USMA DWG NO.
HULL NO.
DWG NO. 6440-507
REV D
SHEET NO. 1 OF 1

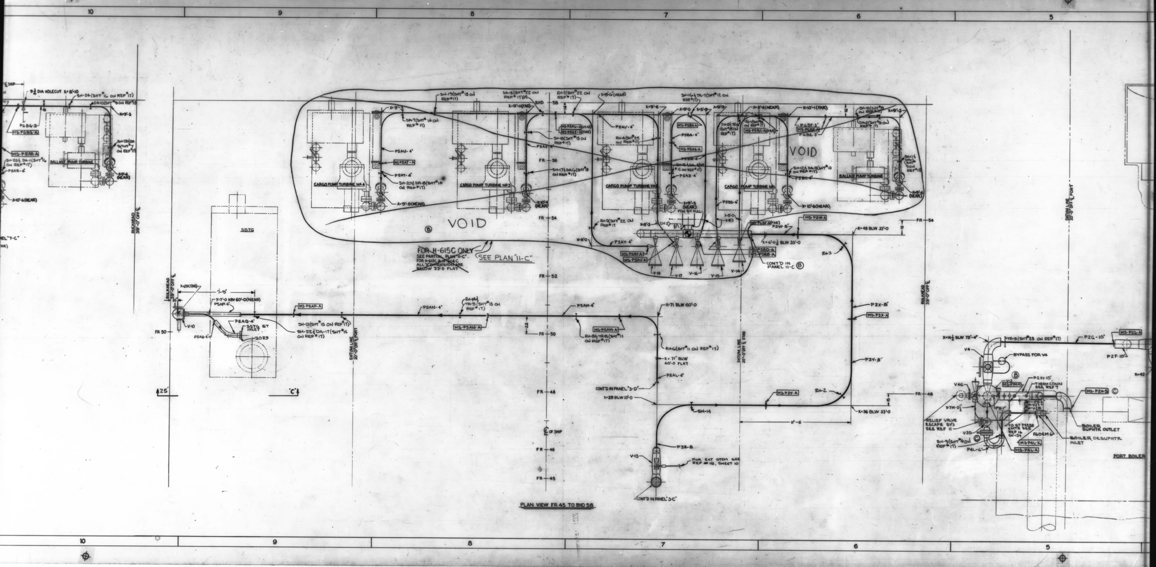
DWG. REV. - HULL APPLIC						
REV	NN HULLS ONLY					
A	YES	YES	YES			
B	YES	YES	YES			
C	YES	YES	NO			
D	YES	YES	NO			

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 10-11-8 SIGNED J. K. Johnson

YARD PRINTS
ORDERED BY DESIGN
GROUP:

6440.507

SEPT. '80
10X
FRAME 1


10
9
8
7
6
5
VOID
VOID
CARGO PUMP TURBINE No 4
CARGO PUMP TURBINE No 3
CARGO PUMP TURBINE No 2
CARGO PUMP TURBINE No 1
BALLAST PUMP TURBINE
BALLAST PUMP TURBINE
SSTG
FOR H-615C ONLY
SEE PARTIAL PLAN "11-C"
SEE PLAN "11-C"
CONT'D IN PANEL 11-C
CONT'D IN PANEL "3-D"
CONT'D IN PANEL "3-C"
MS-P5AN-A
MS-P5AM-A
MS-P5AP-A
MS-P3X-A
MS-P3Y-A
MS-P3W-A
MS-P2G-A
MS-P2H-S
MS-P4L-A
P5AN-4"
P5AM-4"
P5AL-4"
P3X-8"
P3Y-8"
P3W-8"
P3Z-8
P2G-10"
P2F-10"
P2H-10"
P4L-6"
V-10
V-13
V-14
V-15
V-16
V-17
V-18
V4
V46
V20
X=71 BLW 60'-0
X=48 BLW 33'-0
X=36 BLW 33'-0
X=29 BLW 33'-0
SH-14
RH-2
RH-3
FR-56
FR-54
FR-52
FR-50
FR-48
FR-46
FR-45
FR 50
BULKHEAD 39'-0" OFF ℄
DATUM LINE 20'-0" OFF ℄ PORT
℄ OF SHIP
11'-6
BYPASS FOR V4
THERM CONN
RELIEF VALVE ESCAPE SYS SEE REF 11
BOILER SUPHTR OUTLET
BOILER DESUPHTR INLET
PORT BOILER
SSTG ST INLET
FOR EXT STEM SEE REF #18, SHEET 10
25
"C"

PLAN VIEW FR 45 TO BHD 58

6440.507

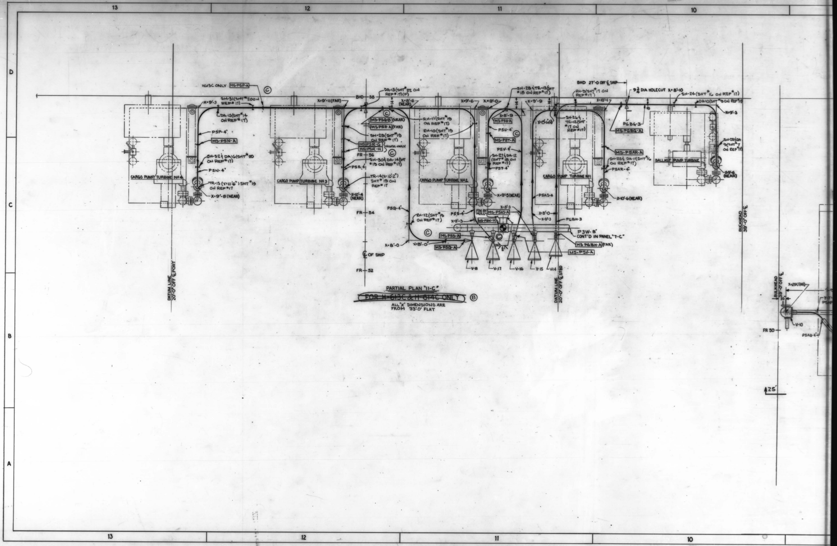
MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 2


13
12
11
10
D
C
B
A
H613C ONLY MS-PSP-A
©
X-9'-3
SH-31(SHT#20 ON REF#17)
DA-15(SHT#14 ON REF#17)
PSP-4"
MS-PSN-A
SH-32 & DA-16(SHT#20 ON REF#17)
PSN-4"
CARGO PUMP TURBINE No4
TR-15 (Y=11'-6") SHT#19 ON REF#17
X-9'-8 (NEAR)
X-9'-11 (FAR)
CARGO PUMP TURBINE No3
BHD 58
DA-13(SHT#22 ON REF#17)(F)
X-8'-6 (NEAR)
14
MS-PSQ-B (NEAR)
MS-PSR-A (FAR)
SH-29(SHT#19 ON REF#17)
MS-PSR-G
MS-PSR-H
H613C ONLY
FR 56
SH-30 & DA-14(SHT#19 ON REF#17)
PSR-4"
TR-14(X=12'-2") SHT#19 ON REF#17
X-10'-4 (NEAR)
FR 54
PSQ-4"
RH-12(SHT#19 ON REF#17)
X-8'-0
X-8'-0"
℄ OF SHIP
FR 52
DATUM LINE 20'-0" OFF ℄ PORT
RH-11(SHT#19 ON REF#17)
RH-10(SHT#19 ON REF#17)
CARGO PUMP TURBINE No2
X-9'-6
X-8'-0
SH-28 & TR-13(SHT#18 ON REF#17)
X-8'-9
MS-PSU-A
PSU-4"
MS-PST-A
PSV-4"
SH-27 & DA-12 (SHT#18 ON REF#17)
PST-4"
X-9'-5 (NEAR)
PSS-4"
FDN BY HULL
MS-PSAS-A
MS-PSW-V
X-8'-3
X-8'-3
MS-PSS-A
MS-PSQ-A
V-18
V-17
V-16
V-15
V-14
X-9'-9
16
X-8'-6(N)
SH-26 & TR-12(SHT#17 ON REF#17)
PSAS-4
X-8'-0
X-8'-3
PGBH-3
P3W-8"
CONT'D IN PANEL "7-C"
MS-PGBH-A (FAR)
MS-PSV-A
DATUM LINE 20'-0" OFF ℄ STBD
CARGO PUMP TURBINE No1
BHD 27'-0 OFF ℄ SHIP
RH-9(SHT#17 ON REF#17)
X-10'-1
9 3/4 DIA HOLECUT X=8'-10
PGBG-3
MS-PGBG-A
8
MS-PSAR-A
SH-25 & DA-11(SHT#16 ON REF#17)
PSAR-4"
X-10'-6 (NEAR)
SH-24 (SHT#16 ON REF#17)
DA-10(SHT#15 ON REF#17)
X-9'-3
BALLAST PUMP TURBINE
SH-23 & DA-9(SHT#7 ON REF#17)
X-9'-6 (NEAR)
BULKHEAD 39'-0" OFF ℄
BULKHEAD
X-29 (FAR)
V-10
FR 50
PSAQ-4"
25

PARTIAL PLAN "11-C"

(~~FOR H-613C & H-614C ONLY~~) Ⓑ

ALL "X" DIMENSIONS ARE FROM 33'-0" FLAT

6440.507

MICRO-MASTER 105 mm

K+E

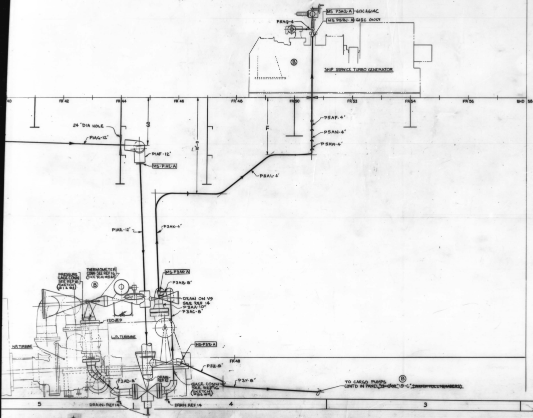
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 3

10X

REVISIONS							
N.N. CHANGE ORDER NR	REV	ZONE	DESCRIPTION	NNS&DDCO DATE	NNS&DDCO AUTHD	OWNER DATE	OWNER APPD
	A	ALL	INITIAL ISSUE	9/19/75		—	—
—	B	5A 6D 4Y 25C	ADDED SPACER BETWEEN GATE VALVE & ANGLE VALVE. ADD 6" FDN UNDER SSTG.				
H-615C-95		ALL	DELETED: ALL PORTIONS OF THE DRAWING WHICH WERE APPLICABLE ONLY TO H-615C, AND MADE THE REMAINING PORTIONS APPLICABLE TO ALL THREE HULLS EXCEPT FOR THE PIPE CONNECTING TO THE SSTG.	4/17/7		—	—
—	C	—	ADDED SKETCH NOS. WHERE REF #16 IS USED.				
			DELETED P5BJ-4" MADE P5AQ-4" APPLICABLE FOR H615C				
		7-C 8-C 10-C	ALTERED P4K-6" & P4L-6" RELOCATING RING & BLANK FLANGE. WORK ACCOMPLISHED ON 613C.	10/11/78		—	—


MS P5AQ-A - 613C & 614C
MS P5BJ-A - 615C ONLY
P5AQ-4
Ⓑ
SHIP SERVICE TURBO GENERATOR
FR 42
FR 44
FR 46
FR 48
FR 50
FR 52
FR 54
FR 56
BHD 58
24" DIA HOLE
P1AG-12"
60
10'-0
71
P5AP-4"
P5AN-4"
P5AM-4"
P1AF-12"
MS-P1AE-A
P5AL-4"
P1AE-12"
P3AK-4"
THERMOMETER CONN-SEE REF 16 (SKETCH #3&4)
PRESSURE GAGE CONN SEE REF 16 (SKETCH #1 & #2)
Ⓑ
MS-P3AK-A
P3AB-8"
DRAIN ON V9 SEE REF 14
P3AA-10"
P3AC-8"
120Z9
L.P. TURBINE
H.P. TURBINE
MS-P3Z-A
FR 48
P3Z-8"
P3AD-8"
DRAIN-REF 12
GAGE CONN SEE REF 16 (SKETCH #8 & #9)
P3Y-8"
DRAIN-REF 14
DRAIN-REF 14
TO CARGO PUMPS
CONT'D IN PANEL ~~"13-C" OR~~ "19-C" ~~(WATCH HULL NUMBERS)~~
Ⓑ

FOR PLAN VIEWS, SEE DWG Nº 6440-507.
FOR LIST OF MATERIAL, SEE 6440-509.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615	311	—
614	310	—
613	309	—

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT
FSCM NO. 43689

SCALE 1/2 INCH = 1 FT
DRAWN ANTHONY STARKEY
CHECKED H. M. EDGE
SECT MGR J. K. Johnson
DATE COMPL. 9-19-75
EXAMINED
AUTHORIZED
DATE 9-19-75
TECH APPROVAL 9-5-76 PWJ
TO MGM 2-6-76
CSD APPROVAL R. L. Harrington

PIPING ARRANGEMENT
MAIN STEAM SYSTEM
SECTION & ELEVATION VIEWS

USMA DESIGN T11-S-116a
USMA DWG NO. ———
HULL NO. ———
DWG NO. 6440-508
REV C
SHEET NO. 1 OF 1

NO.	REFERENCES	DWG NO.

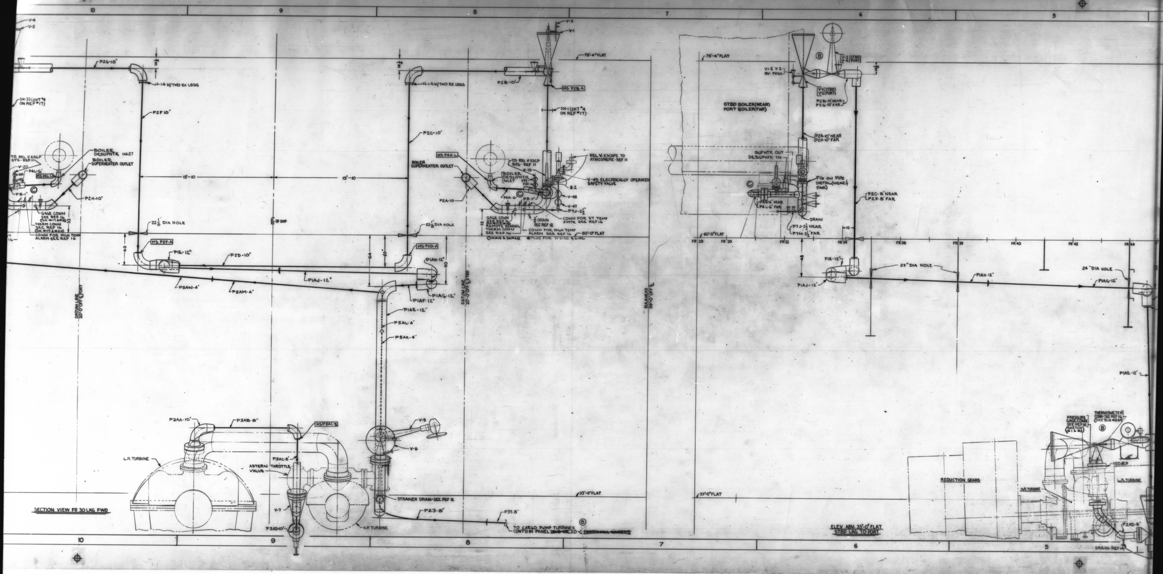
DWG. REV.—HULL APPLIC.			
REV	NN HULLS ONLY		
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	NO

REPRODUCTION OFFICE
YARD PRINTS YES
GROUPING NO
REMARKS
DATE 10-11-78
SIGNED J. K. Johnson
YARD PRINTS
ORDERED BY DESIGN
GROUP:
MC NO.

6440.508

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.

SEPT. '80
FRAME 1
10X


10
9
8
7
6
5
V-4
V-2
P2G-10"
14½
H-14 W/TWO EX LEGS
SH-33 (SHT #4 ON REF #17)
P2F 10"
TO REL V ESCP SYS-REF 11
V-20
P4L-6"
MS-P4L-L
BOILER DESUPHTR INLET
BOILER SUPERHEATER OUTLET
P8-1"
P2H-10"
GAGE CONN SEE REF 16 (SK #17 & #18)
THERM CONN SEE REF 16 (SK #19 & #20)
CONN FOR HIGH TEMP ALARM SEE REF 16
13'-10
13'-10
22⅛" DIA HOLE
℄ OF SHIP
MS-P2F-A
40
PIE-12"
P2D-10"
P1AJ-12"
P5AN-4'
P5AM-4'
DATUM LINE 20'-0" OFF ℄ PORT
V-3
V-1
78'-4" FLAT
P2B-10"
MS-P2B-A
SH-1 (SHT #4 ON REF #17)
P2C-10'
MS-P4K-L
BOILER SUPERHEATER OUTLET
TO REL V. ESCP SYS- REF 11
BOILER DESUPHTR INLET
V-19
V42
V41
REL V. ESCAPE TO ATMOSPHERE - REF 11
V-45 ELECTRICALLY OPERATED SAFETY VALVE
Z2
P2A-10
P4K-6"
P8-1"
V-48
V-47
P7J-2½"
33
GAGE CONN SEE REF 16 (SK #17 & #18)
REMOTE READING THERM CONN SEE REF 16 (SK #19 & SK #20)
¾" DRAIN SEE REF 12
CONN FOR ST TEMP XMTR SEE REF 16
CONN FOR HIGH TEMP ALARM SEE REF 16
#PLUG FOR H-613C & 614C
60'-0" FLAT
22⅛" DIA HOLE
MS-P2D-A
64
10"
P1AH-12"
60
P1AG-12"
P1AF-12"
P1AE-12"
P5AL-4"
P5AK-4"
DATUM LINE 20'-0" OFF ℄ STBD
BULKHEAD 39'-0" OFF ℄
78'-4" FLAT
V-1 & V-2 BY-PASS
Ⓑ
V-3 (STBD)
V-4 (PORT)
V-1 (STBD)
V-2 (PORT)
P2B-10" NEAR
P2G-10" FAR
STBD BOILER (NEAR)
PORT BOILER (FAR)
P2A-10" NEAR
P2H-10" FAR
SUPHTR OUT
DESUPHTR IN
F16 ON PIPE DETAIL (NEAR & FAR)
Ⓒ
P4K-6" NEAR
P4L-6" FAR
DRAIN
P7J-2½" NEAR
P7M-2½" FAR
P2C-8" NEAR
P2F-8" FAR
15
60'-0" FLAT
FR 29
FR 30
FR 32
FR 34
FR 36
FR 38
FR 40
FR 42
FR 44
48
PIE-12"
P1AJ-12"
24" DIA HOLE
P1AH-12"
24" DIA HOLE
P1AG-12"
P1AE-12"
P3AA-10"
P3AB-8"
MS-P3AC-B
V-5
V-6
L.P. TURBINE
P3AC-8"
ASTERN THROTTLE VALVE
V-7
P3AD-10"
H.P. TURBINE
STRAINER DRAIN-SEE REF 12
33'-0" FLAT
P23-8"
P3Y-8"
TO CARGO PUMP TURBINES CONT'D IN PANEL ~~19-B-OR~~ 20-C ~~(WATCH HULL NUMBERS)~~
SECTION VIEW FR 30 LKG FWD
33'-0" FLAT
ELEV ABV 33'-0" FLAT STBD LKG TO PORT
REDUCTION GEARS
H.P. TURBINE
PRESSURE GAGE CONN SEE REF 16 (SKETCH #1 & #2)
THERMOMETER CONN-SEE REF 16 (SKETCH #3 & 4)
120 Z 9
L.P. TURBINE
P3AD-8"
DRAIN-REF 14

6440.508

MICRO-MASTER® 105 mm

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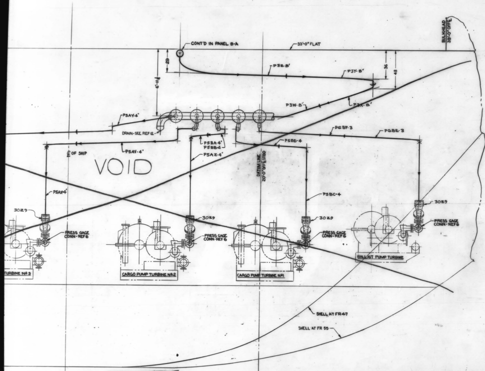
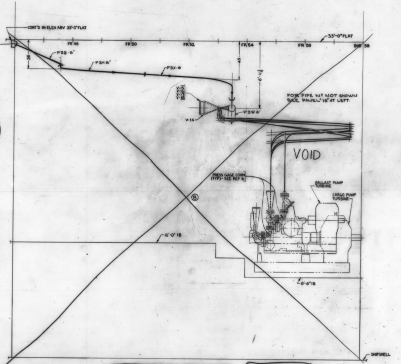
SEPT. '80

FRAME 2

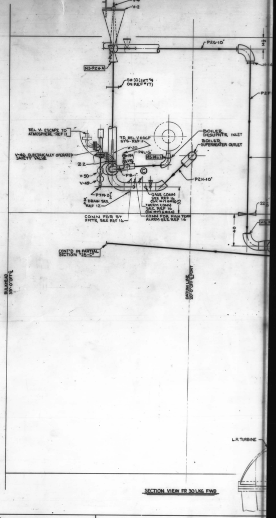
10X


CONT'D IN PANEL 8-A
33'-0" FLAT
BULKHEAD 39'-0" OFF ℄
29
36
48
6'-11¼
P3Z-8'
P3Y-8"
P3W-8"
P3X-8"
P5AY-4"
DRAIN-SEE REF 12
P6BF-3
P6BE-3
P5BA-4"
P5BB-4
P5BD-4
P5AV-4"
P5AZ-4"
℄ OF SHIP
VOID
DATUM LINE 20'-0" OFF ℄ STBD
P5AX-4"
P5BC-4
3029
PRESS GAGE CONN-REF 6
TURBINE Nº3
CARGO PUMP TURBINE Nº2
CARGO PUMP TURBINE Nº1
BALLAST PUMP TURBINE
SHELL AT FR 47
SHELL AT FR 55

~~SECTION LKG FWD-PUMP TURBINES~~ ~~(FOR H-615C ONLY)~~


CONT'D IN ELEV ABV 33'-0" FLAT
33'-0" FLAT
FR 48
FR 50
FR 52
FR 54
FR 56
BHD 58
36
48
6'-11¼
P3Z-8'
P3Y-8"
P3X-8
V-15
V-16
V-17
V-18
V-14
P3W-8"
FOR PIPE Nº NOT SHOWN SEE PANEL "15" AT LEFT.
VOID
PRESS GAGE CONN (TYP)-SEE REF 6
BALLAST PUMP TURBINE
CARGO PUMP TURBINE
Ⓑ
12'-0" IB
8'-6" IB
SHIPSHELL

~~ELEV - PUMP TURBINE PIPING - STBD LKG TO PORT~~ ~~(FOR H-615C ONLY)~~


V-4
V-2
P2G-10"
14½
H-14
MS-P2H-A
SH-33 (SHT #4 ON REF #17)
P2F
REL V. ESCAPE TO ATMOSPHERE - REF 11
TO REL V ESCP SYS-REF 11
V-20
P4L-6"
MS-P4L-L
BOILER DESUPHTR INLET
BOILER SUPERHEATER OUTLET
V-46 ELECTRICALLY OPERATED SAFETY VALVE
Z2
V-50
V-49
P8-1"
Ⓒ
P2H-10"
P7M-2½"
¾" DRAIN SEE REF 12
GAGE CONN SEE REF 16 (SK #17 & #18)
THERM CONN SEE REF 16 (SK #19 & #20)
33
CONN FOR ST XMTR SEE REF 16
CONN FOR HIGH TEMP ALARM SEE REF 16
22
40
MS-P
CONT'D IN PARTIAL SECTION "25-C"
BULKHEAD 39'-0" OFF ℄
DATUM LINE 20'-0" OFF ℄ PORT
L.P. TURBINE

SECTION VIEW FR 30 LKG FWD

6440.508

MICRO-MASTER® 105 mm
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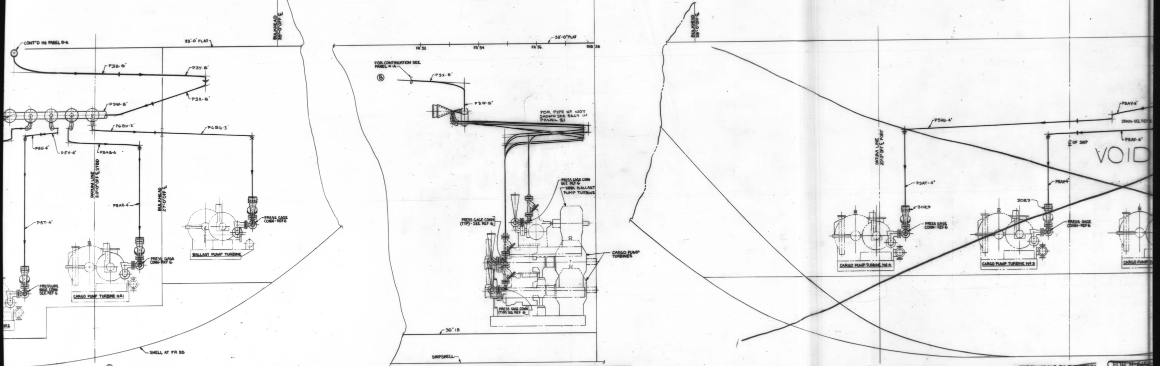
SEPT. '80

10X

FRAME 3

20 19 18 17 16 15


CONT'D IN PANEL 8-A
33'-0" FLAT
BULKHEAD 39'-0" OFF ℄
P3Z-8"
P3Y-8"
P3X-8"
P3W-8"
P6BH-3"
P6BG-3"
P5U-4"
P5V-4"
P5AS-4
DATUM LINE 20'-0" OFF ℄ STBD
BULKHEAD 27'-0" OFF ℄
P5AR-4"
P5T-4"
PRESS GAGE CONN-REF 6
BALLAST PUMP TURBINE
PRESS GAGE CONN-REF 6
CARGO PUMP TURBINE Nº1
PRESSURE GAGE CONN SEE REF 6
Nº2
SHELL AT FR 55
Ⓑ
FR 52
FR 54
FR 56
BHD 58
33'-0" FLAT
FOR CONTINUATION SEE PANEL 4-A
Ⓑ
P3X-8"
P3W-8"
FOR PIPE Nº NOT SHOWN SEE SECT IN PANEL 21
PRESS GAGE CONN SEE REF 6
TANK BALLAST PUMP TURBINE
PRESS GAGE CONN (TYP) - SEE REF 6
CARGO PUMP TURBINES
PRESS GAGE CONN (TYP) SEE REF 6
36" IB
SHIPSHELL
BULKHEAD 39'-0" OFF ℄
P5AU-4"
P5AY-4"
DRAIN-SEE REF 12
P5AV-4"
℄ OF SHIP
VOID
DATUM LINE 20'-0" OFF ℄ PORT
P5AT-4"
P5AX-4"
3029
3029
PRESS GAGE CONN-REF 6
PRESS GAGE CONN-REF 6
CARGO PUMP TURBINE Nº4
CARGO PUMP TURBINE Nº3
CARGO PUMP T

ES ~~(FOR H-613C & H-614C ONLY)~~ Ⓑ

ELEVATION-STBD LKG TO PORT-CARGO AND TANK BALLAST PUMP TURBINES

~~(FOR H-613C & H-614C ONLY)~~ Ⓑ

~~SECTION LKG FWD-PUMP TURBINES~~ ~~(FOR H-615C~~

20 19 18 17 16 15

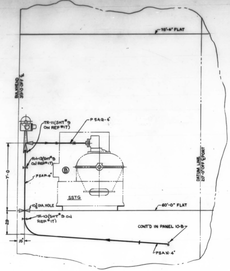
6440.508

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

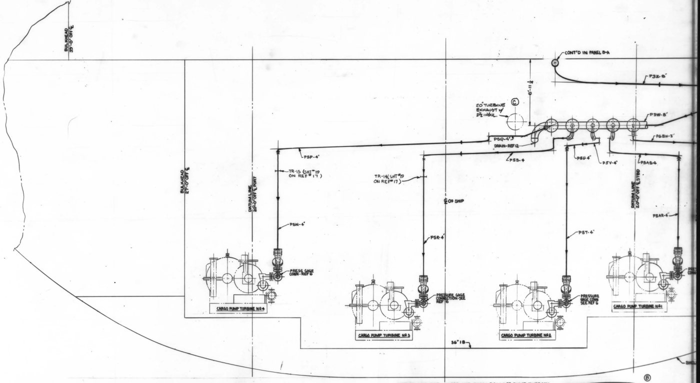
SEPT. '80

FRAME 4

10X


78'-4" FLAT
BULKHEAD 39'-0" OFF ℄
P5AQ-4"
TR-11(SHT#9 ON REF#17)
RH-13(SHT#9 ON REF#17)
Ⓑ
P5AP-4"
7'-0
SSTG
DATUM LINE 20'-0" OFF ℄ PORT
10⅝ DIA. HOLE
60'-0" FLAT
TR-10(SHT#9 ON REF#17)
29
10"
CONT'D IN PANEL 10-B
P5AN-4"

PARTIAL SECTION "25-C"


BULKHEAD 39'-0" OFF ℄
BULKHEAD 27'-0" OFF ℄
DATUM LINE 20'-0" OFF ℄ PORT
CONT'D IN PANEL 8-A
P3Z-8"
6'-11¼
20" TURBINE EXHAUST W/ 2½ INSUL.
Ⓒ
P3W-8"
P5Q-4"
DRAIN-REF 12
P6BH-3"
P5P-4"
P5S-4
P5U-4"
P5V-4"
P5AS-4
TR-15 (SHT#19 ON REF#17)
TR-14(SHT#19 ON REF#17)
℄ OF SHIP
DATUM LINE 20'-0" OFF ℄ STBD
P5AR-4"
P5N-4"
P5R-4"
P5T-4"
PRESS GAGE CONN-REF 6
PRESSURE GAGE CONNECTION-SEE REF 6
PRESSURE GAGE CONN SEE REF 6
CARGO PUMP TURBINE Nº4
CARGO PUMP TURBINE Nº3
CARGO PUMP TURBINE Nº2
CARGO PUMP TURBINE Nº1
36" IB
SHEL
Ⓑ
25
24
23
22
21
D
C
B
A

SECTION LKG FWD - CARGO AND TANK BALLAST PUMP TURBINES ~~(FOR 11-G13C & 11-G14C ONLY)~~

6440.508

MICRO-MASTER 105 mm

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SEPT. '80

FRAME 5

10X

6440.509

CSD VAULT
X163

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS REV "D"
GROUPING YES
DATE 6-4-79
SIGNED J.K. Johnson

ORDERED BY DESIGN

YARD PRINTS

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS															
	REV.	D	D	A	A	D	A	C	A	C	D	B	B	B	B
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14

GROUP
MC NO.

OUT 4"-300# FLG

NNS&DDCO. HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C	311		
614C	310		
613C	309	T11-S-116a	

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	NO	YES	NO

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP DESIGN DEPT.

INSTALLATION GROUP 6440-0114-1001 S1
FOR ARR DWG SEE: 6440-507

SCALE NONE =1 Ft.
DRAWN ANTHONY STARKEY
CHECKED H.M. EDGE
SECT. MGR. J.K. Johnson
DATE COMPL. 9-19-75
EXAMINED
AUTHORIZED
DATE 9-19-75
TECH. APPROVAL NOT REQ'D
CSD APPROVAL R.L. Harrington

HULL 613C
GROUPED BY CHK.
DATES PART COMP.
GROUP NO.
KEY
TYPE OF DWG. —

TITLE
PIPING ARR
MAIN STEAM SYSTEM
LIST OF MATERIAL

DWG. NO. 6440-509 REV D SHEET NO. 1 OF 14

486

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D	OWNER DATE	OWNER APPD.
A		INITIAL ISSUE RJP	9/19/75	JKJ	—	—
B	10 9,11,12,13,&14 8,7	MATL SOURCES ALTD-DESIGN DEVELOPMENT DELETED ALL ITEMS WHICH WERE FOR USE ON H-615C ONLY EXCEPT FOR P5BJ. THE ABOVE TO SUIT CHANGE ORDER # H-615C-95. W.A.S.	6/14/7	AC JKJ*	—	—
C	7 9	MADE LINE 13 APPLICABLE TO ALL SHIPS DELETED LINE 13	10/24/8	AC JKJ	—	—
	5	ALTERED SOURCE OF MAT'L (LN 1) ERS				
D	5 10	ADDED LINE 14. ADDED LINES 16, 17, + 18. (WORK ACCOMP ON H613C) ERS	6/5/79	RC KWL	—	—

NOTES:

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF #1.

NO.	REFERENCES	DWG. NO.
1	DIAGRAM - MAIN STEAM SYS - LIST	6440-506

HULL NO. 613C, 614C, 615C DWG. NO. 6440-509
REV. D SHEET 2 OF —

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V1	10" ANGLE STOP CHK BW 1¼CR-½MO STL 900#	FURN W/PIPE DETAIL SEE 6440-510	PS	
		2	1	V2	10"			
		3	1	V3	10" GATE 900# BW. 1¼CR-½MO STL			
		4	1	V4	10"			
		5	1	V5	12"			
		6	1	V6	12" ANGLE STOP BW 900# 1¼CR-½MO STL			
		7	1	V7	10" GLOBE STOP FLG'D 1¼CR-½MO STL 900#	PO (1-G) 6100-M1	MD-PS	
		8	1	V9	4" ANGLE STOP BW 900# 1¼CR-½MO STL	FURN W/PIPE DETAIL SEE 6440-510	PS	
		9	1	V10	4" ANGLE STOP BW 900# 1¼CR-½MO STL MOTOR OPER			
		10	1	V13	8" GATE 900# BW 1¼CR-½MO STL			
		11	1	V14	3" ANGLE STOP BW 900# 1¼CR-½MO STL			
		12	1	V15	4"			
		13	1	V16	4"			
		14	1	V17	4"			
		15	1	V18	4"			
		16	1	V19	2½"x4" PILOT OPER SAFETY 1500# FLG'D 1¼CR-½MO STL	PO (1-K) 6800-M1	1J4 MD-PS	
		17	1	V20	2½"x4"			
		18	1	V25	½" GLOBE STOP 900# SW 1¼CR-½MO STL	PO (1) 6440-M7		

REMARKS -

SERVICE - MAIN STEAM SYSTEM
MC NO - PS=167
APPLICABLE HULLS 613C 614C 615C
GROUP NO. 6440-0114-1001 S1 SH 1 OF 12
DWG NO. 6440-509 SHEET 3 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V-26	½ GLOBE STOP 900# SW 1¼CR-½MO STL	PO (1) 6440-M7	PS	
		2	1	V-27	½"			
		3	1	V-28	½"			
		4	1	V-33	½"			
		5	1	V34	½"			
		6	1	V41	1"	(3)		
		7	1	V-42	1"			
		8	1	V-43	1"			
		9	1	V-44	1"			
		10	1	V-45	2½"x4" ELEC OPER SAFETY FLG'D 1¼CR-½MO STL	PO (1-K) 6800-M1	1J1 MD-PS	
		11	1	V-46	2½"x4"			
		12	1	V-47	2½" GATE BW 900# 1¼CR-½MO STL	FURN W/PIPE DETAIL SEE 6440-510	PS	
		13	1	V-48	2½"			
		14	1	V-49	2½"			
		15	1	V-50	2½"			
		16						
		17						
		18						

REMARKS -

SERVICE - MAIN STEAM SYSTEM
MC NO - PS=167
APPLICABLE HULLS 613C 614C 615C
GROUP NO. 6440-0114-1001 S1 SH 2 OF 12
DWG NO. 6440-509 SHEET 4 REV. A

INSTALLATION GROUP.

REV.		LINE NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	2	F6DEM6	6" 90° ELL LR BW CR-MO STL	PO (5) 6440-C17	MD-PS	
		2	10	F1	10" BACKING RING CR-MO SCH 80	MO 6440-530 S1 L-17	ST-PS	
		3	5	F2	12"	S-1 L-18		
		4	2	F3	2½"	S1 L-12		
		5	6	F4	6"	S1 L-15		
		6	2	F5	3"	S1 L-13		
		7	16	F7	4"	S1 L-14		
		8	6	F9	8"	S1 L-16		
		9	47'-0"	F-10	2½" IPS X X-HVY PIPE STEEL	S/57-07-108K	PS	
		10	35'-0"	F-11	3"x3"x5/16" ∠ STEEL	S/73-05-242		
		11	18'-6"	F-12	6"x4"x12# I	S/73-08-222		
		12	1	F-13	PUNCH PAD STEEL 6"x6"x½" THK PLT.	S/ 72-40-290		
		13						
D		14	1	J-1	¾" 1500# BLIND FLANGE CHR-MOLY STEEL	PO (1) 6555-C13	ST-PS	
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - MAIN STEAM SYS
MC NO PS=167
APPLICABLE HULLS 613C 614C 615C
GROUP NO. 6440-0114-1001 S1 SH 3 OF 12
DWG NO. 6440-509 SHEET 5 REV. D

& OUTFITTING GROUPS

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2A	10" 10.75"OD X .594"THK CR-MO PIPE	PMD 6440-510	PS	
		2	1	P2B				
		3	1	P2C				
		4	1	P2D				
		5	1	P1.E	12" 12.75"OD X .688"THK CR-MO PIPE			
		6	1	P2F	10" 10.75"OD X .594"THK CR-MO PIPE			
		7	1	P2G				
		8	1	P2H				
		9	1	P7J	2½" 2.875"OD X .276"THK CR-MO PIPE			
		10	1	P4K	6" 6.625"OD X .432 THK			
		11	1	P4L	6"			
		12	1	P7M	2½" 2.875"OD X .276"THK CR-MO PIPE			
		13	1	P3W	8" 8.625"OD X .500"THK CR-MO PIPE			
		14	1	P3X				
		15	1	P3Y				
		16	1	P3Z				
		17	1	P3AA				
		18	1	P3AB				

REMARKS -

SERVICE - MAIN STEAM SYS
MC NO - PS=167
APPLICABLE HULLS 613C 614C 615C
GROUP NO. 6440-0114-1001 S1 SH4 OF 12
DWG NO. 6440-509 SHEET 6 REV. A

& OUTFITTING GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3AC	8" 8.625"OD X .500"THK CR-MO PIPE	PMD 6440-510	PS	
		2	1	P3AD				
		3	1	P1AE	12" 12.75"OD X .688 THK CR-MO PIPE			
		4	1	P1AF				
		5	1	P1AG				
		6	1	P1AH				
		7	1	P1AJ				
		8	1	P5AK	4" 4.5"OD X .337"THK CR-MO PIPE			
		9	1	P5AL				
		10	1	P5AM				
		11	1	P5AN				
		12	1	P5AP				
C		13	1	P5AQ				
		14						
		15						
		16	36"	P8	1" 1.315"OD X .147"THK CR-MO PIPE	PO 608C (1) 6440-M16	MD-PS	
		17	24"	P9	½" .840"OD X .147"THK CR-MO PIPE	PO (6) 6440-C9		
		18						

REMARKS -

SERVICE - MAIN STEAM SYS
MC NO - PS=167
APPLICABLE HULLS 613C 614C 615C
GROUP NO. 6440-0114-1001 S1 SH 5 OF 12
DWG NO. 6440-509 SHEET 7 REV. C

& OUTFITTING GROUPS

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P5N	4" 4.5"OD X .337 THK CR-MO PIPE	PMD 6440-510	PS	
		2	1	P5P				
		3	1	P5Q				
		4	1	P5R				
		5	1	P5S				
		6	1	P5T				
		7	1	P5U				
		8	1	P5V				
		9	1	P5AR				
		10	1	P5AS				
		11	1	P6BG	3" 3.5"OD X .300 CR-MO PIPE			
		12	1	P6BH				
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - MAIN STEAM SYS
MC NO - PS=167
APPLICABLE HULLS 613C 614C 615C
GROUP NO. 6440-0114-1001 S1 SH 6 OF 12
DWG NO. 6440-509 SHEET 8 REV. B

& OUTFITTING GROUPS

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	~~1~~	~~P5AT~~	~~4" 4.5"OD X .337"THK CR-MO PIPE~~	~~PMD 6440-510~~	PS	
B		2	~~1~~	~~P5AU~~				
B		3	~~1~~	~~P5AV~~				
B		4	~~1~~	~~P5AX~~				
B		5	~~1~~	~~P5AY~~				
B		6	~~1~~	~~P5AZ~~				
B		7	~~1~~	~~P5BA~~				
B		8	~~1~~	~~P5BB~~				
B		9	~~1~~	~~P5BC~~				
B		10	~~1~~	~~P5BD~~				
B		11	~~1~~	~~P6BE~~	~~3" 3.5"OD X .300"THK CR-MO PIPE~~			
B		12	~~1~~	~~P6BF~~				
C		13	1	P5BJ	~~4" 4.5"OD X .337"THK CR-MO PIPE~~	~~PMD 6440-510~~		
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - MAIN STEAM SYS
MC NO - PS=167
APPLICABLE HULLS 615C
GROUP NO. 6440-0114-1001 S1 SH 7 OF 12
DWG NO. 6440-509 SHEET 9 REV. C

6440-509

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

6440-509

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

FLANGED JOINT LIST & OUTFITTING GROUP

NN 3569

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	48	3029	3"	BOLTS	STUDS 7/8" ALLOY STL L=7 3/4"	MO SH. 1, L14 216686	ST-PS	
	2	96			NUTS	7/8" HVY HEX ALLOY STL	PO 6440-C20 ④		
	3	6			GSKT	900# FLEXITALLIC STYLE CG	6440-C15 ①		
	4	20	12029	12"	BOLTS	STUDS 1 3/8" ALLOY STL L=10 1/2"	MO SH 1 L[illegible] 216686		
	5	40			NUTS	1 3/8" HVY HEX ALLOY STL	PO 6440-C20 ①		
	6	1			GSKT	900# FLEXITALLIC STYLE CG	6440-C15 ②		
	7	32	Z2	2 1/2"	BOLTS	STUD 1" ALLOY STL L= 7"	MO SH 1 [illegible] 216686		
	8	64			NUTS	1" HVY HEX ALLOY STL	PO 6440-C20 ③		
	9	4			GSKT	1500# FLEXITALLIC STYLE CG.	6440-C15 ③		
	10	16	10029	10	BOLTS	STUD 1 3/8" ALLOY STL L=9 1/2"	MO SH 1 L16 216686		
	11	32			NUTS	1 3/8" HVY HEX ALLOY STL	PO 6440-C20 ①		
	12	1			GSKT	900# FLEXITALLIC STYLE CG	6440-C15 ④	MD-PS	
	13	–	Z1	10"	BOLTS	FURN WITH TURBINE	—	–	
	14	–			NUTS		—	–	
	15	1			GSKT	1500 FLEXITALLIC STYLE CG	6440-C15 ⑤	MD-PS	
D	16	4	Z2	3/4"	BOLT STUDS	3/4" ALLOY STL L=4 3/4"	PO 6440-C21 ⑦	ST-PS	
D	17	8			NUTS	3/4" HVY HEX ALLOY STL	PO 6440-C21 ⑨		
D	18	1			GSKT	900# FLEXITALLIC STYLE CG	5/15-04-142		
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - MAIN STEAM SYSTEM

MC/NO-PS=167

GROUP NO. 6440-0114-1001 S1 SH 8 OF 12

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6440-509 SHEET 10 REV. D

INSTALLATION GROUP - PIPE SUPPORTS

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	SH-1	SPRING HANGER ASS'Y	PO 6440-M8 ①	PS	
		2	1	SH-2		②		
		3	1	SH-3		③		
		4	1	SH-4		④		
		5	1	SH-5		⑤		
		6	1	SH-6 & TR-4	SPRING HANGER & TIE ROD ASS'Y	⑥		
		7	1	SH-7	SPRING HANGER ASS'Y	⑦		
		8	1	SH-8		⑧		
		9	1	SH-9		⑨		
B		10	~~1~~	~~SH-10~~		~~⑩~~		
B		11	~~1~~	~~SH-11 DA-1~~	~~SPRING HANGER & DIRECTIONAL ANCHOR ASS'Y~~	~~⑪~~		
B		12	~~1~~	~~SH-12~~	~~SPRING HANGER ASS'Y~~	~~⑫~~		
B		13	~~1~~	~~SH-13 TR-6~~	~~SPRING HANGER & TIE ROD ASS'Y~~	~~⑬~~		
		14	1	SH-14	SPRING HANGER ASS'Y	PO 6440-M8 ⑭		
B		15	~~1~~	~~SH-15~~		~~⑮~~		
B		16	~~1~~	~~SH-16 TR-7~~	~~SPRING HANGER & TIE ROD ASSY~~	~~⑯~~		
B		17	~~1~~	~~SH-17 DA-6~~	~~SPRING HANGER & DIRECTIONAL ANCHOR ASS'Y~~	~~⑰~~		
B		18	~~1~~	~~SH-18~~	~~SPRING HANGER ASS'Y~~	~~⑱~~		

REMARKS -

SERVICE - MAIN STEAM SYSTEM

MC/NO-PS=167

GROUP NO. 6440-0114-1001 S1 SH 9 OF 12

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6440-509 SHEET 11 REV. B

INSTALLATION GROUP - PIPE SUPPORTS

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	~~1~~	~~SH-19~~	~~SPRING HANGER ASSY~~	~~PO 6440-M8 ⑲~~	PS	
B		2	~~1~~	~~SH-20 DA-8~~	~~SPRING HANGER & DIRECTIONAL ANCHOR ASSY~~	~~⑳~~		
		3	1	SH-21	SPRING HANGER ASS'Y	PO 6440-M8 ㉑		
		4	1	SH-22		㉒		
		5	1	SH-23 DA-9	SPRING HANGER & DIRECTIONAL ANCHOR ASS'Y	㉓		
		6	1	SH-24	SPRING HANGER ASS'Y	㉔		
		7	1	SH-25		㉕		
		8	1	SH-26 TR-12	SPRING HANGER & TIE ROD ASSY	㉖		
		9	1	SH-27	SPRING HANGER ASS'Y	㉗		
		10	1	SH-28 TR-13	SPRING HANGER & TIE ROD ASS'Y	㉘		
		11	1	SH-29	SPRING HANGER ASS'Y	㉙		
		12	1	SH-30 DA-14	SPRING HANGER & DIRECTIONAL ANCHOR ASS'Y	㉚		
		13	1	SH-31	SPRING HANGER ASS'Y	㉛		
		14	1	SH-32 DA-16	SPRING HANGER & DIRECTIONAL ANCHOR ASS'Y	㉜		
		15	1	SH-33	SPRING HANGER ASSY	㉝		
		16	1	SH-34		㉞		
B		17	~~1~~	~~RH-1~~	~~ROD HANGER ASSY~~	~~㉟~~		
		18	1	RH-2		PO 6440-M8 ㊱		

REMARKS -

SERVICE - MAIN STEAM SYSTEM

MC/NO-PS=167

GROUP NO. 6440-0114-1001 S1 SH 10 OF 12

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6440-509 SHEET 12 REV. B

INSTALLATION GROUP - PIPE SUPPORTS

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	RH-3	ROD HANGER ASSY	PO 6440-M8 ㊲	PS	
B		2	~~1~~	~~RH-4~~		~~㊳~~		
B		3	~~1~~	~~RH-5~~		~~㊴~~		
		4	1	RH-6		PO 6440-M8 ㊵		
B		5	~~1~~	~~RH-7~~		~~㊶~~		
		6	1	RH-8 TR8	ROD HANGER & TIE ROD ASSY	PO 6440-M8 ㊷		
		7	1	RH-9	ROD HANGER ASSY	㊸		
		8	1	RH-10		㊹		
		9	1	RH-11		㊺		
		10	1	RH-12		㊻		
		11	1	RH-13		㊼		
		12	1	TR-1	TIE ROD ASSY	㊽		
		13	1	TR-2		㊾		
		14	1	TR-3		㊿		
		15	1	TR-5		(51)		
		16	1	TR-9		(52)		
		17	1	TR-10		(53)		
		18	1	TR-11		(54)		

REMARKS -

SERVICE - MAIN STEAM SYSTEM

MC/NO-PS=167

GROUP NO. 6440-0114-1001 S1 SH 11 OF 14

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6440-509 SHEET 13 REV. B

INSTALLATION GROUP - PIPE SUPPORTS

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	TR-14	TIE ROD ASSY	P.O 6440-M8 (55)	PS	
		2	1	TR-15		(56)		
B		3	~~1~~	~~DA-2~~	~~DIRECTIONAL ANCHOR ASSY~~	~~(57)~~		
		4	1	DA-5	DIRECTIONAL ANCHOR ASSY	PO 6440-M8 (58)		
B		5	~~1~~	~~DA-7~~		~~(59)~~		
		6	1	DA-10		PO 6440-M8 (60)		
		7	1	DA-13		(61)		
		8	1	DA-15		(62)		
B		9	~~1~~	~~DA-3~~		~~(63)~~		
B		10	~~1~~	~~DA-4~~		~~(64)~~		
		11	1	DA-17		PO 6440-M8 (65)		
		12	1	DA-11		(66)		
		13	1	DA-12		(67)		
		14						
		15						
		16						
		17						
		18						

REMARKS -

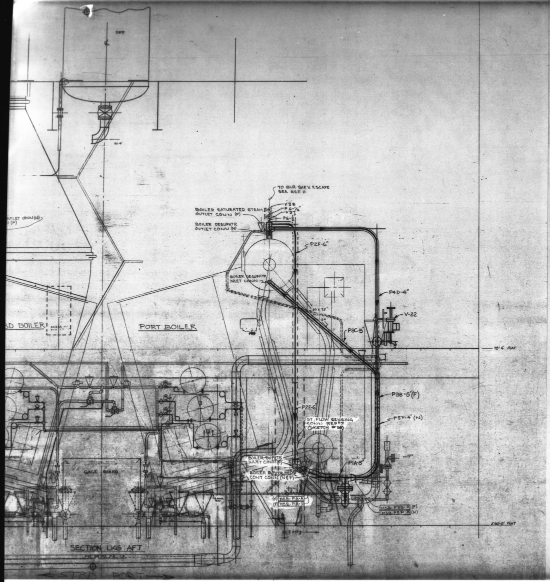
SERVICE - MAIN STEAM SYSTEM

MC/NO-PS=167

GROUP NO. 6440-0114-1001 S1 SH 12 OF 12

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6440-509 SHEET 14 REV. B


DFT
TO BLR SAF V. ESCAPE SEE REF 11
BOILER SATURATED STEAM OUTLET CONN (F)
BOILER DESUPHTR OUTLET CONN (N)
V38
P6-1/2"
V37
P6-1/2"
P2F-6"
BOILER DESUPHTR INLET CONN
P4D-4"
V-22
P3C-5"
BD BOILER
PORT BOILER
76'-4" FLAT
P3B-5"(F)
P2E-6
ST FLOW SENSING CONN REF #9 (SKETCH #36)
P5P-4" (N)
BOILER SUPHTR INLET CONN (F)
BOILER SUPHTR TEMP CONT CONN (N&F)
P1A-8"
(N) MSB-P1A-A
(F) MSB-P1A-N
MSB-P3B-A (F)
MSB-P5P-A (N)
GAGE BOARD
60'-0" FLAT
SECTION LKG AFT
STBD PORT

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
A	ALL	INITIAL ISSUE			—	—
B	1C 1B	ALTERED NOTE #16. ADDED REF #12.	6/15/77			
C	—	ADDED SKETCH NOS WHERE REF #9 IS USED ALT'D LOCATION OF WELDS MSB-P3B-A & P5P-A.	5/15/78			

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCES 1 AND 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REFERENCE 1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. AND REFERENCE 3.
4. BACKING RINGS AND COUPLINGS SHOWN IN LIST OF MAT'L ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMP AND ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REFERENCE 6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REFERENCE 1.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REFERENCE 4.
10. INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REFERENCE 5.
11. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
12. ALL PIPING ON THIS DRAWING IS CLASS I.
13. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE TYPE P3 FOR BUTT WELDS & TYPE P14 FOR SOCKET WELDS IN ACCORDANCE WITH REF 3 UNLESS OTHERWISE NOTED
14. LOCATION DIMENSIONS ARE FOR REFERENCE AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
15. SYMBOLS MSB-P1A-A ETC INDICATE WELDS REQUIRING NDT & STRESS RELIEF AS LISTED ON REF # 10
16. Ⓑ HANGERS (SH1 FOR EXAMPLE) AND TIE RODS (TR1 FOR EXAMPLE) INDICATED ON REF # 12 ARE TO BE INSTALLED WITHIN 6" OF POSITION SHOWN.

FOR LIST OF MATERIAL, SEE 6440-518.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS

ABS

USCG

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPT.
FSCM NO. 43689

NO.	REFERENCES	DWG NO.
Ⓑ 12	PIPE HGRS - BOILER SATURATED STEAM & SUPERHEATER CONTROL - ER	6440-541
11	PP ARR BLR SAF VLV ESC SYS	6451-468
10	WELD INDEX BLR SAT ST & SUPHTR CONT PIPING	6440-527
9	PP ARR MISC INSTRUMENT IN ENG ROOM	6755-67
8	PP DET BLR SAT ST & SUPER HTR CONTROL	6440-519
7	PP ARR H.P. STEAM DRAIN SYS	6555-475
6	PAINTING SCHEDULE	8300-40 * 8300-41 Δ
5	DIRECTIONS FOR INSULATIONS & LAGGING PIPING	257322
4	TYPICAL ARR OF GAGE PIPING	6750-481
3	FABRICATION & WELDING INSTRUCTIONS - CL I & II PP	257035
2	DIAG MN STEAM & SUPERHTD AUX STEAM SYS - ARR	6440-505
1	DIAG MN STEAM & SUPERHTD AUX STEAM SYS - L/M	6440-506

* HULL 612C & 614C
Δ HULL 615C ONLY

SCALE 1/2" = 1 FT
DRAWN E.R. SMOOT
CHECKED H.M. EDGE
SECT MGR J.R. Johnson
DATE COMPL 8-11-76
EXAMINED
AUTHORIZED
DATE 8-12-76
TECH APPROVAL 4/15/76
CSD APPROVAL

PIPING ARR BOILER SATURATED STEAM & SUPER HEATER CONTROL

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO.
DWG NO. 6440-517
REV C
SHEET NO. 1 OF 1

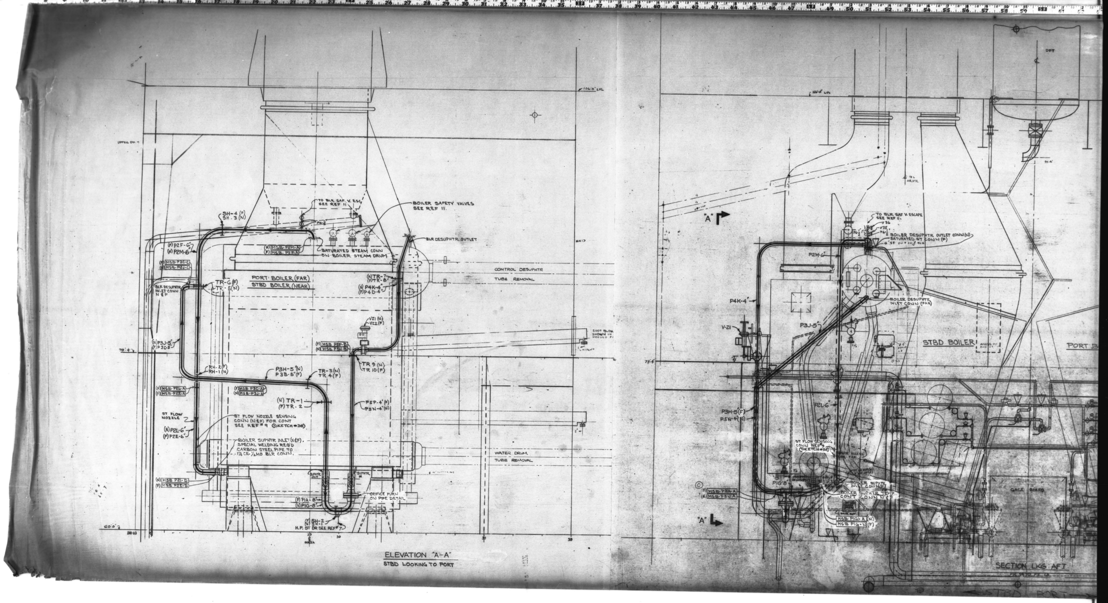
REPRODUCTION OFFICE

GROUP: MC NO.

6440.517

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 1
10X



106'-0" LVL
TO BLR SAF. V. ESC. SEE REF 11
BOILER SAFETY VALVES SEE REF 11.
SH-4 (F)
SH-3 (N)
(F) P2F-6"
(N) P2M-6"
(N) MSB-P2M-A
(F) MSB-P2F-A
SATURATED STEAM CONN ON BOILER STEAM DRUM
BLR DESUPHTR OUTLET
(N) MSB-P3C-C
(N) MSB-P3J-C
BLR DESUPHTR INLET CONN N & F
TR-6 (F)
TR-5 (N)
PORT BOILER (FAR)
STBD BOILER (NEAR)
(N) TR-7
(F) TR-8
(N) P4K-4"
(F) P4D-4"
CONTROL DESUPHTR
TUBE REMOVAL
V21 (N)
V22 (F)
(F) MSB-P5P-B
(N) MSB-P5N-B
SOOT BLOW. SHOWN IN
(N) P3J-5"
(F) P3C-5"
78'-4"
RH-2 (F)
RH-1 (N)
P3H-5" (N)
P3B-5" (F)
TR-3 (N)
TR 4 (F)
TR 9 (N)
TR 10 (F)
(N) MSB-P2L-A
(F) MSB-P2E-A
(F) MSB-P3C-A
(N) MSB-P3J-A
(N) TR-1
(F) TR-2
P5P-4" (F)
P5N-4" (N)
ST FLOW NOZZLE
ST FLOW NOZZLE SENSING CONN (N & F) FOR CONT SEE REF # 9 (SKETCH #38)
(N) P2L-6"
(F) P2E-6"
BOILER SUPHTR INLET (N & F). SPECIAL WELDING REQ'D CARBON STEEL PIPE TO 1¼ CR-½ MO BLR CONN.
WATER DRUM
TUBE REMOVAL
(N) MSB-P2L-D
(F) MSB-P2E-D
SUPHTR OUT
SUPHTR IN
ORIFICE FURN ON PIPE DETAIL
(F) P1A-8"
(N) P1G-8"
(F) SH-2
(N) SH-1
H.P. ST DR SEE REF 7
60'-0"
29
30
35
38
"A"
"A"
TO BLR SAF. V. ESCAPE SEE REF 11.
V36
V35
P2M-6"
BOILER DESUPHTR OUTLET CONN (N)
SATURATED ST CONN (F)
P4K-4"
BOILER DESUPHTR INLET CONN (FAR)
V-21
P3J-5"
STBD BOILER
PORT B
P2L-6"
P3H-5" (F)
P5N-4" (N)
ST FLOW SENSING CONN REQ'D (SKETCH #38)
P1G-8"
BOILER SUPHTR INLET CONN
BOILER SUPHTR TEMP CONT CONN N & F
(F) MSB-P3H-A
(N) MSB-P5N-A
MSB-P1G-A (N)
MSB-P1G-N (F)
GAGE BOARD

ELEVATION "A-A"
STBD LOOKING TO PORT

SECTION LKG AFT

6440.517

SEPT. '80
FRAME 2
10X

6440-518

CSD Vault

E

REPRODUCTION OFFICE

YARD PRINTS ypo

REMARKS

GROUPING ypo

DATE 10-3-7

SIGNED J.K. Johnson

	REV.	DATE ISSUED
	A	8/11/76
	B	10/3/77

YARD PRINTS — ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS						
REV.	B	B	A	A	B	B
SHEET	1	2	3	4	3A	5

GROUP

MC NO.

NNS&DDCO. HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C	311		
614C	310		
613C	309	T-11-S-116a	

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
A	Yes	Yes	Yes
B	Yes	Yes	Yes

APPROVALS

OWNERS

ABS NR

USCG NR

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING DEPT

ARRANGEMENT DWG; 6440-517
PIPE DETAIL DWG; 6440-519
INSTALLATION GROUP; 6440-0114-1202 P1
6440-0114-1103 P1

SCALE NONE =1 Ft.
DRAWN E.R. SMOOT
CHECKED H.M. EDGE
SECT. MGR. J.K. Johnson

DATE COMPL. 8-11-76
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 8-12-76

TECH. APPROVAL NR

CSD APPROVAL R.L. Hannington

GROUPED: CHK. / BY
DATES: COMP. / PART
HULL 613C / GROUP NO. / KEY

TYPE OF DWG. —

TITLE
PIPING ARR BOILER SATURATED STEAM & SUPER HTR CONTROL L/M

DWG. NO. 6440-518 REV B SHEET NO. 1 OF 4

MO 8½ X 14

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APPD.
A	—	INITIAL ISSUE	8/11/76	JKJ	—	—
B	3A,5	ADDED SHTS 3A & 5.	10/3/77	JKJ	—	—

NOTES

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF#1

NO.	REFERENCES	DWG. NO.
1	DIAG MN ST & SUPHTD AUX STEAM SYS L/M	6440-506

HULL NO. 613C, 614C, 615C DWG. NO. 6440-518
REV B SHEET 2 OF 4

MN46 8½ X 14

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1G	8" IPS X .500 THK PIPE 1¼CR-½MO STL	PMD 6440-519	PS	
		2	1	P2L	6" IPS X .432" THK PIPE C-STL	↓		
		3	1	P2M	↓			
		4	1	P3H	5" IPS X .375" THK PIPE 1¼CR-½MO STL			
		5	1	P3J	↓			
		6	1	P4K	4" IPS X .337" THK PIPE C-STL			
		7	1	P5N	4" IPS X .337" THK PIPE 1¼CR-½MO STL	↓		
		8	6"	P6	½" IPS X .147" THK PIPE C-STL	S/ 57-07-102K		
		9		VALVE Nº				
		10	1	V35	½" GLOBE STOP 900# SW C-STL	PO ④ 6450-C9	MD-PS	
		11	1	V36	½" ↓	↓		
		12	1	V21	4" FLOW CONT V. 900# 1¼CR-½MO	FURN WITH PIPE DET ON 6440-519	PS	
		13		FITTING Nº				
		14	2	F1	8" BACKING RING X-HVY 1¼CR-½MO STL	MO 6440-530 SH 7 L 16	ST-PS	
		15	3	F2	5"	MO 6440-530 SH 8 L 14		
		16	2	F3	4"	MO 6440-530 SH 7 L 14		
		17	1	F4	6" ↓	MO 6440-530 SH 7 L 15		
		18	2	60WS2	6" BACKING RING X-HVY CARBON STEEL	S 25-20-948		
		19	1	40WS2	4" ↓	S/ 97-18-106		

MC NO PS 152

SERVICE - BLR SAT. ST & SUPHTR CONT SYS

GROUP NO. 6440-0114-1103 P1 SHT 1 OF 2

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6440-518 SHEET 3 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	12'-0"	F-5	6"x4"x8.5# I STEEL	MO 283096 S.1 L.1	ST-PS	
B		2	30'-0"	F-6	3"x3"x⅜" ∠ STEEL	MO 257726 S.3 L.14	↓	
B		3	1	HANGER Nº	DESCRIPTION			
B		4	1	TR-1	5" TIE ROD ASSY	PO (79) 6440-M8	MD-PS	
B		5	1	TR-3	5" TIE ROD ASSY	↓ (77)	↓	
B		6	1	TR-5	6" TIE ROD ASSY	MO 257726 S.29 L.13	ST-PS	
B		7	1	TR-7	4" TIE ROD ASSY	PO (73) 6440-M8	MD-PS	
B		8	1	TR-9	4" TIE ROD ASSY	↓ (75)		
B		9	1	SH-1	8" SPRING HANGER	PO (69) 6440-M8		
B		10	1	SH-3	6" SPRING HANGER	PO (63) 6552-C16		
B		11	1	RH-1	5" ROD HANGER	PO (71) 6440-M8	↓	
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - BLR SAT. ST. & SUPHTR CONT SYS

GROUP NO. 6440-0114-1103 P1 SHT 2 OF 2

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6440-518 SHEET 3A REV. B

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1A	8" IPS X .500" THK PIPE 1¼CR-½MO STL	PMD 6440-519	PS	
		2	1	P2E	6" IPS X .432" THK PIPE CARBON STEEL	↓		
		3	1	P2F	6" ↓			
		4	1	P3B	5" IPS X .375" THK PIPE 1¼CR-½MO STL			
		5	1	P3C	5" ↓			
		6	1	P4D	4" IPS X .337 THK PIPE CARBON STEEL			
		7	1	P5P	4" IPS X .337 THK PIPE 1¼CR ½MO STL	↓		
		8	6	P6	½" IPS X .147" THK PIPE CARBON STEEL	S/ 57-07-100K		
		9	1	VALVE Nº V22	4" FLOW CONT 900# 1¼CR-½MO	FURN WITH PIPE DET. ON 6440-519		
		10	1	V37	½" GLOBE STOP 900# SW CARBON STEEL	PO. ④ 6450-C9	MD-PS	
		11	1	V38	½" ↓	↓		
		12		FITTING Nº				
		13	2	F1	8" BACKING RING X-HVY 1¼CR-½MO STL	MO 6440-530 SH 7 L 16	ST-PS	
		14	3	F2	5"	MO 6440-530 SH 8 L 14		
		15	2	F3	4"	MO 6440-530 SH 7 L 14		
		16	1	F4	6" ↓	MO 6440-530 SH 7 L 15		
		17	2	60WS2	6" BACKING RING X-HVY CARBON STEEL	S/ 25-20-948		
		18	1	40WS2	4" ↓	S 97-18-106		

REMARKS -

MC NO PS 152

SERVICE - BLR SAT. ST & SUPHTR CONT SYS

GROUP NO. 6440-0114-1202 P1 SHT 1 OF 2

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6440-518 SHEET 4 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	12'-0"	F-5	6"x4"x8.5# I STEEL	MO 283096 S.1 L.1	ST-PS	
B		2	30'-0"	F-6	3"x3"x⅜" ∠ STEEL	MO 257726 S.3 L.14	↓	
B		3		HANGER Nº	DESCRIPTION			
B		4	1	TR 2	5" TIE ROD ASSY	PO (80) 6440-M8	MD-PS	
B		5	1	TR-4	5" TIE ROD ASSY	↓ (78)	↓	
B		6	1	TR-6	6" TIE ROD ASSY	MO 257726 S.30 L.1	ST-PS	
B		7	1	TR-8	4" TIE ROD ASSY	PO (74) 6440-M8	MD-PS	
B		8	1	TR-10	4" TIE ROD ASSY	↓ (76)		
B		9	1	SH-2	8" SPRING HANGER ASSY	PO (70) 6440-M8		
B		10	1	SH-4	6" SPRING HANGER ASSY	PO (64) 6552-C16		
B		11	1	RH-2	5" ROD HANGER ASSY	PO (72) 6440-M8	↓	
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - BLR SAT. ST & SUPHTR CONT SYS

GROUP NO. 6440-0114-1202 P1 SHT 2 OF 2

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6440-518 SHEET 5 REV. B

6440-518

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

WELD JOINT INDEX
NN 198-2 (REV. 1)
JOINT MAP DWG. NO. — ARR. DWG. NO. 6440-507 DETAIL DWG. NO. 6440-510 INDEX DWG. NO. 6440-526 REV. C

LINE	WELD IDENTIFICATION (1)	MATL (2)	NOM SIZE (3)	WALL THK (4)	JOINT TYPE (5)	WELD PROCEDURE (6)	ROOT PASS PT/SX (7)	ROOT PASS MT/SX (8)	VT (9)	PT (10)	MT (11)	RT (12)	POST WELD HEAT TREATMENT (13)	1ST (14)	2ND (15)	3RD (16)	4TH (17)	REMARKS (18)	REV. (19)
1	MS-P2A-A	CR-MO	10"	.595	P3	CSW-1	NA NA	NA	NA	NA	NA							*	
2	B						NA	NA			NA								
3	C						NA NA	NA			NA								
4	D						NA NA	NA			NA								
5	E				P72		NA NA	NA				NA							
6	F						NA NA	NA				NA							
7	G						NA NA	NA				NA							
8	H						NA NA	NA				NA							
9	J				P68		NA NA	NA				NA							
10	K				P72		NA NA	NA				NA							
11	L						NA NA	NA				NA							
12	M				P3		NA NA	NA			NA								
13	N				P17		NA NA	NA			NA	NA							
14	MS-P2B A				P3		NA	NA			NA							*	
15	B						NA	NA			NA								
16	C						NA	NA			NA								
17	D						NA	NA			NA								
18	MS-P2C A						NA	NA			NA							*	
19	B						NA	NA			NA								

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM MAIN STEAM
COMPARTMENT ENG ROOM
HULL 615C 613C 614C
NAVSHIPS DRAWING NO. —
REV. ~~A~~
SHEET 3

WELD JOINT INDEX
NN 198-2 (REV. 1)
JOINT MAP DWG. NO. — ARR. DWG. NO. 6440-507 DETAIL DWG. NO. 6440-510 INDEX DWG. NO. 6440-526 REV. C

LINE	WELD IDENTIFICATION (1)	MATL (2)	NOM SIZE (3)	WALL THK (4)	JOINT TYPE (5)	WELD PROCEDURE (6)	ROOT PASS PT/SX (7)	ROOT PASS MT/SX (8)	VT (9)	PT (10)	MT (11)	RT (12)	POST WELD HEAT TREATMENT (13)	1ST (14)	2ND (15)	3RD (16)	4TH (17)	REMARKS (18)	REV. (19)
1	MS P4K A	CR-MO	6"	.432	P3	CSW-1	NA NA	NA	NA	NA	NA							*	
2	NOT USED							—			—	—	—						
3	C				P3			NA			NA								
4	D							NA			NA								
5	E							NA			NA								
6	F							NA			NA								
7	G							NA			NA								
8	H							NA			NA								
9	NOT USED						—	—			NA	—	—						
10	K							NA			NA							*	
11	L							NA			NA							*	
12	MSP4L A							NA			NA							*	
13	NOT USED				—		—	—			—	—	—						
14	C				P3			NA			NA								
15	D							NA			NA								
16	E							NA			NA								
17	F							NA			NA								
18	G							NA			NA								
19	H							NA			NA								

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM MAIN STEAM
COMPARTMENT ENG ROOM
HULL 615C 613C 614C
NAVSHIPS DRAWING NO. —
REV. [illegible]
SHEET 6

WELD JOINT INDEX
NN 198-2 (REV. 1)
JOINT MAP DWG. NO. — ARR. DWG. NO. 6440-507 DETAIL DWG. NO. 6440-510 INDEX DWG. NO. 6440-526 REV. H

LINE	WELD IDENTIFICATION (1)	MATL (2)	NOM SIZE (3)	WALL THK (4)	JOINT TYPE (5)	WELD PROCEDURE (6)	ROOT PASS PT/SX (7)	ROOT PASS MT/SX (8)	VT (9)	PT (10)	MT (11)	RT (12)	POST WELD HEAT TREATMENT (13)	1ST (14)	2ND (15)	3RD (16)	4TH (17)	REMARKS (18)	REV. (19)
1	MS P3W K	CR-MO	4"	.337	P3	CWS-1	NA NA	NA	NA	NA	NA								
2	L							NA			NA								
3	M							NA			NA								
4	N							NA			NA								
5	P							NA			NA								
6	Q							NA			NA								
7	R							NA			NA								
8	S		3	.300				NA			NA		NA						
9	T							NA			NA		NA						
10	~~U~~		~~8"~~	~~.477~~	~~P17~~			~~NA~~			~~NA~~	~~NA~~						~~*~~	H
11	MS P3AA-A				P3			NA			NA							*	
12	B		10"	.595				NA			NA								
13	C							NA			NA								
14	MS P3AB-B		8"	.477				NA			NA								
15	~~MS P3AC-A~~							~~NA~~			~~NA~~							~~*~~	H
16	B				P-3			NA			NA							*	G
17	C				P3			NA			NA								
18	D							NA			NA								
19																			

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM MAIN STEAM
COMPARTMENT ENG ROOM
HULL 615C 613C 614C
NAVSHIPS DRAWING NO. —
REV. —
SHEET 9

PIPING WELD INDEX TABULATION
FORM 596

REV.	IDENTIFICATION SHT. NO.	IDENTIFICATION LINE NO.	DESCRIPTION	DATE	APP'D.
A	–	–	INITIAL ISSUE	4/9/6	
B	2&8,14	–	DELETE REFERENCE TO H-613C & 614C ONLY		
	12	18-19	DELETE		
	13	ALL	DELETE		
	14	1-9	DELETE. ALL TO SUIT NN CO# H615C-95		
	4 5	4-18 1,7,8	ALTERED COL. 8		
	15	7,8	ADDED gCB	7/25/7	
C	ALL		UPDATED	8/15/7	
D	8	3	ADDED MS-P5R-F BACK TO LIST		
	15	6	DELETED gCB	2/3/8	
	14	18	ADDED		
E	5	12	ADDED		
	15	12,13	ADDED	8/11/8	
	9	16	ADDED		
F	9	16	DELETED.		
	14	15	ADDED.		
	15	13	ALTERED WELD IDENTIFICATION NO. WAS P2H-R.	9/6/8	
	15	14-17	ADDED. ERS		
G	15	18,19	ADDED ERS		
	9	11,12,13	P3 WAS P2	10/3/8	
	9	16	REINSTATED P3AC-B		
H	4	3	DELETED		
	5	11	ADDED L'S 13-17	10/24/8	
	9	10&15	DELETED L'S 10&15.		
J	15	19	MS-P2D-C WAS MS P2D-D		
	14	18	MS-P6BH-B MARKED 'NOT USED' FOR H-614C		

HULL NO. 613C, 614C, 615C
DWG. NO. 6440-526
SHEET NO. 2
REV. J

WELD JOINT INDEX
NN 198-2 (REV. 1)
JOINT MAP DWG. NO. — ARR. DWG. NO. 6440-507 DETAIL DWG. NO. 6440-510 INDEX DWG. NO. 6440-526 REV. H

LINE	WELD IDENTIFICATION (1)	MATL (2)	NOM SIZE (3)	WALL THK (4)	JOINT TYPE (5)	WELD PROCEDURE (6)	ROOT PASS PT/SX (7)	ROOT PASS MT/SX (8)	VT (9)	PT (10)	MT (11)	RT (12)	POST WELD HEAT TREATMENT (13)	1ST (14)	2ND (15)	3RD (16)	4TH (17)	REMARKS (18)	REV. (19)
1	MS P2H E	CR-MO	10"	.595	P68	CSW-1	NA NA	NA NA	NA	NA		NA							B
2	F				P72			NA				NA							
3	G							NA NA				NA							
4	H							NA NA				NA							
5	J							NA NA				NA							
6	K				P3			NA			NA								
7	L							NA			NA								B
8	M							NA NA			NA								B
9	N				P68			NA NA				NA							
10	P				P17			NA NA			NA	NA							
11	Q				P3			NA			NA								
12	MS-P2H-R				P72			NA NA				NA							E
13	MS-P5R-G	CR-MO	4"	.337	P3	CSW-1	NA NA	NA	NA	NA	NA							* H613C ONLY	H
14	MS-P5R-H						NA NA	NA	NA	NA	NA							* H613C ONLY	H
15	MS-P5P-A						NA NA	NA	NA	NA	NA							* H613C ONLY	H
16	MS-P5Q-B						NA NA	NA	NA	NA	NA							*	H
17	MS-P5T-A						NA NA	NA	NA	NA	NA							*	H
18																			
19																			

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM MAIN STEAM
COMPARTMENT ENG ROOM
HULL 615C 613C, 614C
NAVSHIPS DRAWING NO. —
REV. [illegible]
SHEET 5

WELD JOINT INDEX
NN 198-2 (REV. 1)
JOINT MAP DWG. NO. — ARR. DWG. NO. 6440-507 DETAIL DWG. NO. 6440-510 INDEX DWG. NO. 6440-526 REV. D

LINE	WELD IDENTIFICATION (1)	MATL (2)	NOM SIZE (3)	WALL THK (4)	JOINT TYPE (5)	WELD PROCEDURE (6)	ROOT PASS PT/SX (7)	ROOT PASS MT/SX (8)	VT (9)	PT (10)	MT (11)	RT (12)	POST WELD HEAT TREATMENT (13)	1ST (14)	2ND (15)	3RD (16)	4TH (17)	REMARKS (18)	REV. (19)
1	MS P5R D	CR-MO	4"	.337	P3	CSW-1	NA NA	NA	NA	NA	NA								
2	E				P17			NA NA			NA	NA							
3	F				P17			NA NA			NA	NA							D
4	MSP5S A				P3			NA			NA							*	
5	MS P5T B		3"	.300				NA			NA		NA						
6	C		3"					NA			NA		NA						
7	D		4"	.337				NA			NA								
8	E				P17			NA NA			NA	NA							
9	MS P5U A				P3			NA			NA							*	
10	MS P5V A							NA			NA							*	
11	MS P3W A		8"	.477				NA			NA							*	
12	B				P72			NA NA				NA							
13	C				P3			NA			NA								
14	D							NA			NA								
15	E				P68			NA NA				NA							
16	F							NA NA				NA							
17	G							NA NA				NA							
18	H							NA NA				NA							
19	J							NA NA				NA							

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM
COMPARTMENT ENG ROOM
HULL 615C 613C, 614C
NAVSHIPS DRAWING NO. —
REV. —
SHEET 8

6440.526

CSD VAULT
X 163

WELD INDEX TABULATION
FORM 595

REPRODUCTION SECTION

YARD PRINTS: YES	GROUPING: NO
PRINTS: K50 JHJ CSD-V, 2 (USCG LOCAL) 2 (ABS LOCAL)	REMARKS:
	DATE: 10-3-8 SIGNED: JH Johnson

4-13-76 XEROX/K50 JHJ. CSD-V 8-4-76 JHJ CSD-V K50 4PS 3PF 4X03 RYSEP'A	7-28-77 ENB MOV K50 JHJ CSD-V 4PF 12PS 6MI 4X03 RYSEP'A	8-19-77 CSD-V JHJ K50 4PF 12PS 6MI 4X03 RYSEP'A	2-9-78 JHJ CSD-V K50 4PF 12PS 6MI 4X03 RYSEP'A 8-17-78 JHJ K50 CSD-V 2 USCG/LOCAL 2 ABS/LOCAL 12PS 4MI 3X03 RYSEP'A 2PF	9-12-78 CSD-V JHJ 2 USCG/LOCAL 2 ABS/LOCAL 2PF 12PS 4MI 3X03 K50 RYSEP'A 10-12-78 CSD-V JHJ K50 2 USCG/LOCAL 2 ABS/LOCAL [illegible] 12PS 4MI RYSEP'A			

GENERAL NOTES

1. PIPING WELDED JOINTS ARE TO BE FABRICATED IN ACCORDANCE WITH NN DWG 257035
2. ASTERISK (*) IN REMARKS COLUMN DENOTES WELDS JOINTS MADE ON THE SHIP & INDICATED ON BODY OF THE PIPING ARRANGEMENT.

PARTIAL ISSUE

REF. DWGS.
6440-507 PIPING ARR MN ST SYS
6440-510 PIPE DETAILS MN ST SYS

HULL: ~~615C~~ 614C 613C
VESSEL IDENTIFICATION NO.
DRAWN BY H.M.E
CHECKED BY H.M. EDGE
SUPERVISOR JH Johnson 4/9/76
APPROVED
DESIGN DIV.
DEPT. COMMERCIAL DESIGN
TITLE WELD INDEX TABULATION FOR MAIN STEAM SYSTEM
471
N.N. DWG. NO. 6440-526
REV. J
CASE DRAWER VAULT SHEET 1 OF 15

WELD JOINT INDEX
NN 198-2 (REV. 1)
JOINT MAP DWG. NO. — ARR. DWG. NO. 6440-507 DETAIL DWG. NO. 6440-510 INDEX DWG. NO. 6440-526 REV. H

LINE	WELD IDENTIFICATION (1)	MATL (2)	NOM SIZE (3)	WALL THK (4)	JOINT TYPE (5)	WELD PROCEDURE (6)	ROOT PASS PT/SX (7)	ROOT PASS MT/SX (8)	VT (9)	PT (10)	MT (11)	RT (12)	POST WELD HEAT TREATMENT (13)	1ST (14)	2ND (15)	3RD (16)	4TH (17)	REMARKS (18)	REV. (19)
1	MS-P2D-A	CR-MO	10"	.595	P3	CSW-1	NA NA	NA	NA	NA	NA							*	
2	B							NA											
3	~~C~~				~~P17~~			~~NA~~			~~NA~~	~~NA~~						~~*~~	H
4	MS-P1E-A				P3			NA			NA							*	B
5	B		12"	.705				NA			NA								
6	C							NA			NA								
7	D							NA			NA								
8	E							NA			NA								
9	F		10"	.595				NA			NA								
10	MS-P2F-A							NA			NA							*	
11	B							NA			NA								
12	MS P2G A							NA			NA							*	
13	B							NA			NA								
14	C							NA			NA								
15	D							NA			NA								
16	MS P2H A							NA			NA							*	
17	B							NA			NA								
18	C				P72			NA NA				NA							
19	D							NA NA											

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM MAIN STEAM
COMPARTMENT ENG ROOM
HULL 615C 613C/614C
NAVSHIPS DRAWING NO. —
REV. [illegible]
SHEET 4

WELD JOINT INDEX
NN 198-2 (REV. 1)
JOINT MAP DWG. NO. — ARR. DWG. NO. 6440-507 DETAIL DWG. NO. 6440-510 INDEX DWG. NO. 6440-526 REV. C

LINE	WELD IDENTIFICATION (1)	MATL (2)	NOM SIZE (3)	WALL THK (4)	JOINT TYPE (5)	WELD PROCEDURE (6)	ROOT PASS PT/SX (7)	ROOT PASS MT/SX (8)	VT (9)	PT (10)	MT (11)	RT (12)	POST WELD HEAT TREATMENT (13)	1ST (14)	2ND (15)	3RD (16)	4TH (17)	REMARKS (18)	REV. (19)
1																			
2	MS P4L K	CR-MO	6"	.432	P3	CSW1	NA NA	NA	NA	NA	NA							*	
3	L						NA NA	NA	NA	NA	NA							*	
4																			
5																			
6																			
7																			
8																			
9																			
10	MS P5N A	CR-MO	4"	.337	P3	CSW1	NA NA	NA	NA	NA	NA							*	
11	B		3"	.300				NA			NA		NA						
12	C		3"					NA			NA		NA						
13	D		4"	.337				NA			NA								
14	E				P17			NA NA			NA	NA							
15	MS P5P B				P17			NA NA			NA	NA							
16	MS P5Q A				P3			NA			NA							*	
17	MS P5R A							NA			NA							*	
18	B		3"	.300				NA			NA		NA						
19	C		3"					NA			NA		NA						

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM MAIN STEAM
COMPARTMENT ENG ROOM
HULL 615C 613C, 614C
NAVSHIPS DRAWING NO. —
REV. —
SHEET 7

6440-526

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

8X

FRAME

WELD JOINT INDEX
NN 198-2 (REV. 1)

JOINT MAP DWG. NO. —
ARR. DWG. NO. 6440-507
DETAIL DWG. NO. 6440-510
INDEX DWG. NO. 6440-526
REV. C

LINE	WELD IDENTIFICATION	MATL	JOINT NOM SIZE	JOINT WALL THK	JOINT TYPE	WELD PROCEDURE	ROOT PASS PT/SX	ROOT PASS MT/SX	FINAL WELD VT	FINAL WELD PT	FINAL WELD MT	FINAL WELD RT	POST WELD HEAT TREATMENT	NN 45-5 SERIAL NUMBERS 1ST	2ND	3RD	4TH	REMARKS	REV.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	MS P5AR A	CR-MO	4"	.337	P3	CSW-1	NA NA	NA	NA	NA	NA							*	
2	B		3"	.300				NA			NA		NR						
3	C		3"	.300				NA			NA		NR						
4	NOT USED		—	—	—			—			—	—	—						
5	E		4"	.337	P3			NA			NA								
6	F				P17			NA NA			NA	NA							
7	MS P5AS A				P3			NA			NA							*	
8	~~MS P5AT A~~							NA										* HULL 615C ONLY	
9	B							NA											
10	C							NA											
11	D				P72			NA NA				NA							
12	E				P3			NA			NA								
13	F				P17			NA NA				NA							
14	MS P5AU- A				P3			NA			NA							*	
15	B				P17			NA NA				NA							
16	MS P5AV A				P3			NA			NA							*	
17	MS P5AX A				-			NA										*	
18	B							NA											
19	C							NA											

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM MAIN STEAM
COMPARTMENT ENG ROOM
HULL 615C 613C,614C
NAVSHIPS DRAWING NO. —
REV. —
SHEET 12

WELD JOINT INDEX
NN 198-2 (REV. 1)

JOINT MAP DWG. NO. —
ARR. DWG. NO. 6440-507
DETAIL DWG. NO. 6440-510
INDEX DWG. NO. 6440-526
REV. G

LINE	WELD IDENTIFICATION	MATL	JOINT NOM SIZE	JOINT WALL THK	JOINT TYPE	WELD PROCEDURE	ROOT PASS PT/SX	ROOT PASS MT/SX	FINAL WELD VT	FINAL WELD PT	FINAL WELD MT	FINAL WELD RT	POST WELD HEAT TREATMENT	NN 45-5 SERIAL NUMBERS 1ST	2ND	3RD	4TH	REMARKS	REV.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	MS-P5BJ-A	CR-MO	4	.377	P3	CSW-1	NA NA	NA	NA	NA	NA							* HULL 615C ONLY	
2	B							NA			NA								
3	D							NA			NA								
4	MS-P2A- P		10"	.595	P68			NA NA				NA							
5	MS P2A- Q				P3			NA			NA								
6	NOT USED				—			NA NA			—	—							D
7	MS-P2B-E			.595	P3			NA			NA								B
8	MS-P2G-E							NA			NA								B
9	MS-P1AE-P		12"	.702	P72			NA NA				NA							
10	-R				P72			NA NA				NA							
11	MS-P3AD-B		8"	.477	P3			NA			NA								
12	MS-P2A-R		10"	.595	P72			NA NA				NA							E
13	MS-P2H-S		10"		P3			NA NA			NA							*	F
14	MS-P5R-G		4"	.337	P3			NA			NA								F
15	MS-P3X-A		8"	.477	P3														F
16	MS-P3Y-A		8"	.477	P3														F
17	MS-P3Z-A		8"	.477	P3														F
18	MS-P3W-V		8"	.477	P13A			NA NA		NA	NA	NA							G
19	MS-P2D-C		10'	.595				NA NA		NA	NA	NA							J

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM MAIN STEAM
COMPARTMENT ENG ROOM
HULL 615C 613C,614C
NAVSHIPS DRAWING NO. —
REV. —
SHEET 15

WELD JOINT INDEX
NN 198-2 (REV. 1)

JOINT MAP DWG. NO. —
ARR. DWG. NO. 6440-507
DETAIL DWG. NO. 6440-510
INDEX DWG. NO. 6440-526
REV. C

LINE	WELD IDENTIFICATION	MATL	JOINT NOM SIZE	JOINT WALL THK	JOINT TYPE	WELD PROCEDURE	ROOT PASS PT/SX	ROOT PASS MT/SX	FINAL WELD VT	FINAL WELD PT	FINAL WELD MT	FINAL WELD RT	POST WELD HEAT TREATMENT	NN 45-5 SERIAL NUMBERS 1ST	2ND	3RD	4TH	REMARKS	REV.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	MS P1AF A	CR-MO	12"	.705	P3	CSW-1	NA NA	NA	NA	NA	NA							*	
2	B							NA			NA								
3	MS P1AG A							NA			NA							*	
4	B							NA			NA								
5	MS P1AH- A							NA			NA							*	
6	MS P1AJ- A							NA			NA							*	
7	B							NA			NA								
8	MS P5AK- A		4"	.337				NA			NA							*	
9	MS P5AL- A							NA			NA							*	
10	MS P5AM- A							NA			NA							*	
11	MS P5AN A							NA			NA							*	
12	MS P5AP A							NA			NA							*	
13	B				P17			NA NA			NA	NA							
14	C							NA NA			NA	NA							
15	MS P5AQ A				P3			NA			NA							* HULL 613C & 614C ONLY	
16	B							NA			NA								
17	NOT USED				—			—			—	—							
18	D				P3			NA			NA								
19																			

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM MAIN STEAM
COMPARTMENT ENG ROOM
HULL 615C 613C,614C
NAVSHIPS DRAWING NO. —
REV. —
SHEET 11

WELD JOINT INDEX
NN 198-2 (REV. 1)

JOINT MAP DWG. NO. —
ARR. DWG. NO. 6440-507
DETAIL DWG. NO. 6440-510
INDEX DWG. NO. 6440-526
REV. J

DELETE

LINE	WELD IDENTIFICATION	MATL	JOINT NOM SIZE	JOINT WALL THK	JOINT TYPE	WELD PROCEDURE	ROOT PASS PT/SX	ROOT PASS MT/SX	FINAL WELD VT	FINAL WELD PT	FINAL WELD MT	FINAL WELD RT	POST WELD HEAT TREATMENT	NN 45-5 SERIAL NUMBERS 1ST	2ND	3RD	4TH	REMARKS	REV.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	~~MS P5BD A~~	~~CR-MO~~	~~4"~~	~~.377~~	~~P3~~	~~CSW-1~~	~~NA NA~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~							~~* HULL 615C ONLY~~	
2	MS P6BE A		3"	.300				NA										*	
3	B							NA											
4	C							NA											
5	D				P72			NA NA				NA							
6	E				P3			NA			NA								
7	F				P17			NA NA				NA							
8	G				P17														
9	~~MS P6BF A~~				~~P3~~			~~NA~~			~~NA~~							*	
10	MS P6BG A	CR-MO	3"	.300	P3	CSW-1	NA	NA	NA	NA	NA		NA					*	
11	B							NA			NA		NA						
12	C							NA			NA		NA						
13	NOT USED				—			—			—	—	—						
14	E				P3			NA			NA		NA						
15	F							NA			NA		NA						F
16	NOT USED				+			—			—	—	—						
17	MS P6BH A				P3			NA			NA		NA					*	
18	MS P6BH B				P3			NA			NA		NA					NOT USED ON H614C	J
19																			

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM MAIN STEAM
COMPARTMENT ENG ROOM
HULL 615C 613C,614C
NAVSHIPS DRAWING NO. —
REV. —
SHEET 14

WELD JOINT INDEX
NN 198-2 (REV. 1)

JOINT MAP DWG. NO. —
ARR. DWG. NO. 6440-507
DETAIL DWG. NO. 6440-510
INDEX DWG. NO. 6440-526
REV. C

LINE	WELD IDENTIFICATION	MATL	JOINT NOM SIZE	JOINT WALL THK	JOINT TYPE	WELD PROCEDURE	ROOT PASS PT/SX	ROOT PASS MT/SX	FINAL WELD VT	FINAL WELD PT	FINAL WELD MT	FINAL WELD RT	POST WELD HEAT TREATMENT	NN 45-5 SERIAL NUMBERS 1ST	2ND	3RD	4TH	REMARKS	REV.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	MS-P3AD- D	CR-MO	8"	.477	P3	CSW-1	NA NA	NA	NA	NA	NA								
2	E•				P3			NA			NA								
3	F							NA											
4	G							NA											
5	H							NA											
6	MS-P1AE A		12"	.705				NA										*	
7	B							NA											
8	C							NA											
9	D							NA											
10	E							NA											
11	F							NA											
12	G				P68			NA NA				NA							
13	H				P3			NA			NA								
14	J				P72			NA NA				NA							
15	K				P3			NA			NA								
16	L							NA											
17	M				P68			NA NA				NA							
18	N				P3			NA			NA								
19	Q				P3			NA			NA								

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM MAIN STEAM
COMPARTMENT ENG ROOM
HULL 615C 613C,614C
NAVSHIPS DRAWING NO. —
REV. —
SHEET 10

WELD JOINT INDEX
NN 198-2 (REV. 1)

JOINT MAP DWG. NO. —
ARR. DWG. NO. 6440-507
DETAIL DWG. NO. 6440-510
INDEX DWG. NO. 6440-526
REV. C

DELETE

LINE	WELD IDENTIFICATION	MATL	JOINT NOM SIZE	JOINT WALL THK	JOINT TYPE	WELD PROCEDURE	ROOT PASS PT/SX	ROOT PASS MT/SX	FINAL WELD VT	FINAL WELD PT	FINAL WELD MT	FINAL WELD RT	POST WELD HEAT TREATMENT	NN 45-5 SERIAL NUMBERS 1ST	2ND	3RD	4TH	REMARKS	REV.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	MS P5AX D	CR-MO	4"	.337	P72	CSW-1	NA NA	NA NA	NA	NA		NA						FOR HULL 615C ONLY	
2	E				P3			NA			NA								
3	F				P17			NA NA				NA							
4	G																		
5	MS P5AY- A				P3			NA			NA							*	
6	MS P5AZ- A							NA										*	
7	B							NA											
8	C							NA											
9	D				P72			NA NA				NA							
10	E				P3			NA			NA								
11	F				P17			NA NA				NA							
12	MS P5BA A				P3			NA			NA							*	
13	MS P5BB A							NA										*	
14	MS P5BC- A							NA										*	
15	B							NA											
16	C							NA											
17	D				P72			NA NA				NA							
18	E				P3			NA			NA								
19	F				P17			NA NA				NA							

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM MAIN STEAM
COMPARTMENT ENG ROOM
HULL 615C
NAVSHIPS DRAWING NO. —
REV. —
SHEET 13

6440-526

MICRO-MASTER® 105 mm
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SEPT. '80
8X
FRAME

6440-527 C.S.D. VAULT E

WELD INDEX TABULATION
FORM 595

REPRODUCTION SECTION			
YARD PRINTS: YES		GROUPING: YES	
PRINTS: CSD-V, JHJ, K50		REMARKS	
		DATE: 4-5-8	SIGNED: J K Johnson

8-25-76 CSD-V JHJ K50 2 PF 3 PS 4-4x3 Ry/SEP'A 2 MI	4-9-78 CSD-V JHJ K50 4PF 12PS 4MI 4x+3 Ry/SEP'A 4-20-78 CSD-V JHJ K50 4PF 6PS 6MI 4x+3 Ry/SEP'A						

GENERAL NOTES

1. PIPING WELDED JOINTS ARE TO BE FABRICATED IN ACCORDANCE WITH NN DWG 257035
2. ASTERISK (*) IN REMARKS COLUMN DENOTES WELD JOINTS TO BE MADE ON THE SHIP AND ARE INDICATED ON BODY OF THE PIPING ARRANGEMENT.

REF. DWGS.
6440-517- PIPING ARR BLR SAT. ST & SUPHTR CONTROL SYS
6440-519 PIPE DETAILS BLR SAT. ST. & SUPHTR CONTROL SYS

VESSEL IDENTIFICATION NO.	HULL
	~~615C~~
	614C
	613C

DRAWN BY: E.R. SHOOT	DESIGN DIV.: COMMERCIAL SHIP	DEPT.: COMMERCIAL SHIP ENG.
CHECKED BY: H.M. EDGE	TITLE: WELD INDEX TABULATION FOR BOILER SATURATED STEAM & SUPHTR CONTROL PIPING	
SUPERVISOR: J K Johnson 8/11/6		
APPROVED: R. L. Harington	N.N. DWG. NO.: 6440-527	REV.: D
	CASE / DRAWER / VAULT	SHEET 1 OF 6

PIPING WELD INDEX TABULATION
FORM 596

REV.	IDENTIFICATION SHT. NO.	IDENTIFICATION LINE NO.	DESCRIPTION	DATE	APP'D.
A	—	—	INITIAL ISSUE		
B	5	9&10	WELD ID & MATL ALT. H.M.E		
	5	15&16	ADDED gcB	3/3/8	AC JKJ
C	4	8-10 12-16 18, 19	ALTERED COLUMN 8		
	5	15&16	↓ ERS	4/5/8	AC JKJ
D	6 5 4	1-4 17 19	ADDED ADDED COL 13 ADDED NA.	5/17/79	LWC

HULL NO. 613C, 614C, 615C DWG. NO. 6440-527 SHEET NO. 2 REV. D

WELD JOINT INDEX
NN 198-2 (REV. 1)
NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

JOINT MAP DWG. NO. — ARR. DWG. NO. 6440-517 DETAIL DWG. NO. 6440-519 INDEX DWG. NO. 6440-527 REV. A

LINE	WELD IDENTIFICATION 1	MATL 2	JOINT NOM SIZE 3	JOINT WALL THK 4	JOINT TYPE 5	WELD PROCEDURE 6	ROOT PASS PT 5X 7	ROOT PASS MT 5X 8	FINAL WELD VT 9	FINAL WELD PT 10	FINAL WELD MT 11	FINAL WELD RT 12	POST WELD HEAT TREATMENT 13	NN 45-5 SERIAL NUMBERS 1ST 14	2ND 15	3RD 16	4TH 17	REMARKS 18	REV. 19
1	MSB-P1A-A	1¼CR-½MO	8"	.500"	P3	W301	NA NA	NA	NA	NA	NA							*	
2	B							NA											
3	C							NA											
4	D							NA											
5	E							NA											
6	F							NA											
7	G							NA			↓								
8	H				P72			NA				NA							
9	J				P3			NA			NA								
10	K							NA											
11	L							NA											
12	M							NA											
13	↓ N							NA										*	
14	MSB-P1G-A							NA										*	
15	B							NA											
16	C							NA											
17	D							NA											
18	E				-			NA											
19	↓ F	↓	↓	↓	↓	↓		NA	↓	↓	↓								

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN

SYSTEM: BLR SAT ST & SUPHTR CONT PIPING COMPARTMENT: ENG. ROOM HULL: 615C 613C, 614C NAVSHIPS DRAWING NO.: — REV.: — SHEET: 3

WELD JOINT INDEX
NN 198-2 (REV. 1)
NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

JOINT MAP DWG. NO. — ARR. DWG. NO. 6440-517 DETAIL DWG. NO. 6440-519 INDEX DWG. NO. 6440-527 REV. D

LINE	WELD IDENTIFICATION 1	MATL 2	JOINT NOM SIZE 3	JOINT WALL THK 4	JOINT TYPE 5	WELD PROCEDURE 6	ROOT PASS PT 5X 7	ROOT PASS MT 5X 8	FINAL WELD VT 9	FINAL WELD PT 10	FINAL WELD MT 11	FINAL WELD RT 12	POST WELD HEAT TREATMENT 13	NN 45-5 SERIAL NUMBERS 1ST 14	2ND 15	3RD 16	4TH 17	REMARKS 18	REV. 19
1	MSB-P1G-G	1¼CR-½MO	8"	.500"	P3	W301	NA NA	NA	NA	NA	NA								
2	H				P72			NA NA	NA	NA		NA							
3	J				P3			NA			NA								
4	K							NA											
5	L							NA											
6	M							NA											
7	↓ N		↓	↓				NA										*	
8	MSB-P2E-A	CARBON STEEL	6"	.432				NA NA					NA					*	C
9	B							NA NA											C
10	C	↓						NA NA					↓						C
11	↓ D	C-STEEL 1¼CR-½MO						NA										*	
12	MSB-P2F-A	CARBON STEEL						NA NA					NA					*	C
13	↓ B							NA NA											C
14	MSB-P2L-A							NA NA										*	C
15	B							NA NA											C
16	C	↓						NA NA					↓						C
17	↓ D	C-STEEL 1¼CR-½MO						NA										*	
18	MSB-P2M-A	CARBON STEEL						NA NA					NA					*	C
19	↓ B	↓	↓	↓	↓	↓	↓	NA NA	↓	↓	↓		↓						D

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN

SYSTEM: BLR SAT ST & SUPHTR CONT PIPING COMPARTMENT: ENG. ROOM HULL: 615C 613C, 614C NAVSHIPS DRAWING NO.: — REV.: SHEET: 4

WELD JOINT INDEX
NN 198-2 (REV. 1)
NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

JOINT MAP DWG. NO. — ARR. DWG. NO. 6440-517 DETAIL DWG. NO. 6440-519 INDEX DWG. NO. 6440-527 REV. D

LINE	WELD IDENTIFICATION 1	MATL 2	JOINT NOM SIZE 3	JOINT WALL THK 4	JOINT TYPE 5	WELD PROCEDURE 6	ROOT PASS PT 5X 7	ROOT PASS MT 5X 8	FINAL WELD VT 9	FINAL WELD PT 10	FINAL WELD MT 11	FINAL WELD RT 12	POST WELD HEAT TREATMENT 13	NN 45-5 SERIAL NUMBERS 1ST 14	2ND 15	3RD 16	4TH 17	REMARKS 18	REV. 19
1	MSB-P3B-A	1¼CR-½MO	5"	.375	P3	W301	NA NA	NA	NA	NA	NA							*	
2	MSB-P3C-A							NA										*	
3	MSB-P3C-B							NA											
4	MSB-P3C-C							NA										*	
5	MSB-P3H-A							NA										*	
6	MSB-P3J-A							NA										*	
7	B							NA											
8	↓ C		↓	↓				NA										*	
9	MSB-P4D-A		4"	.337				NA											B
10	MSB-P4K-A	↓						NA											B
11	MSB-P5N-A	1¼CR-½MO						NA										*	
12	↓ B							NA										*	
13	MSB-P5P-A							NA										*	
14	↓ B	↓	↓	↓	↓	↓	↓	NA	↓	↓	↓							*	
15	MSB-P2F-C	CARBON STEEL	6"	.432	P3	W301	NA NA	NA NA	NA	NA	NA		NA						C
16	MSB-P2M-C	↓	↓	↓	↓	↓	↓	NA NA	↓	↓	↓		NA						C
17	MSB-P5P-C	1¼CR-½MO	4"	.337	P3	W301	NA NA	NA	NA	NA	NA								D
18																			
19																			

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN

SYSTEM: BLR SAT. ST & SUPHTR CONT PIPING COMPARTMENT: ENG ROOM HULL: 615C 613C, 614C NAVSHIPS DRAWING NO.: — REV.: — SHEET: 5

WELD JOINT INDEX
NN 198-2 (REV. 1)
NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY

JOINT MAP DWG. NO. — ARR. DWG. NO. 6440-517 DETAIL DWG. NO. — INDEX DWG. NO. 6440-527 REV. D

LINE	WELD IDENTIFICATION 1	MATL 2	JOINT NOM SIZE 3	JOINT WALL THK 4	JOINT TYPE 5	WELD PROCEDURE 6	ROOT PASS PT 5X 7	ROOT PASS MT 5X 8	FINAL WELD VT 9	FINAL WELD PT 10	FINAL WELD MT 11	FINAL WELD RT 12	POST WELD HEAT TREATMENT 13	NN 45-5 SERIAL NUMBERS 1ST 14	2ND 15	3RD 16	4TH 17	REMARKS 18	REV. 19
1	MSB-P2L-E	CARB STL	6"	.432	P3	W301	NA NA	NA NA	NA	NA	NA		NA					SHIPWELD	
2	MSB-P2L-F						NA NA	NA NA											
3	MSB-2PE-E						NA NA	NA NA											
4	MSB-2PE-F	↓	↓	↓	↓	↓	NA NA	NA NA	↓	↓	↓		↓						
5																		↓	

SEE LIAISON 613C- JHJ-103

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN

SYSTEM: MAIN STEAM COMPARTMENT: HULL: 613C NAVSHIPS DRAWING NO.: — REV.: — SHEET: 6

6440-527

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

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SEPT. '80

FRAME

8X

NOTES:

1. FOR KEY PLAN SHOWING LOCATION OF HANGERS IN SHIP SEE REF#1. MATERIAL IS GROUPED ON REF#2.
2. WHERE INDICATED, SUPPORTS, FOUNDATIONS AND REINFORCEMENTS ARE TO BE PROVIDED BY HULL DEPT.
3. HANGERS MAY BE MOVED SLIGHTLY (6" TO EITHER SIDE OF LOCATION SHOWN) TO SUIT CONDITIONS ON SHIP, EXCEPT THOSE COVERED BY NOTE #2

HULL NO. 613C, 614C, 615C DWG. NO. 6440-531
REV A SHEET 3 OF

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	AUTH'D	OWNER DATE	APPD.
A	—	INITIAL ISSUE	2/26/6		—	—
B	10 12 14 15 16 18	ALTERED DA-3 ALTERED DA-4 ALTERED PIPE NO. FOR DA-8 & SH-20. ALTERED TR-9 & ADDED RH-14 ALTERED SH-25. ADDED 20° ANGLE TO DA-12.	4/1/6		—	—
C	8,9,10 12,13,14 22	UPDATED TO SUIT CHANGE ORDER H615C-95	5/5/7		—	—

NO.	REFERENCES	DWG. NO.
2	- LIST	6440-509
1	PIPING ARRGT - MAIN STEAM SYSTEM - PLAN VIEW	6440-507

HULL NO. 613C, 614C, 615C DWG. NO. 6440-531
REV C SHEET 2 OF

6440-531

CSD Vault
X163

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 6-15-7
SIGNED

YARD PRINTS
ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV.	C	C	A	A	A	A	A	C	C	C	A	C	C	C	B	B	A	B	A	A	A	C	A
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

REV. STATUS OF SHEETS

DWG. REV. — HULL APPLIC.	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES

HULL	NNS HULL No.	SHIP'S NAME
615C	311	
614C	310	
613C	309	

APPROVALS
OWNERS NR
USNA DESIGN NR
ABS NR
USCG NR

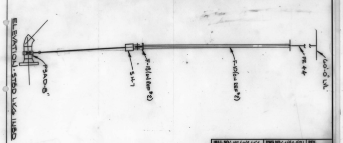
Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP DESIGN DEPT.
HANGERS ARE ORDERED ON 6440-509

SCALE 1/2" = 1 Ft.
DRAWN W.J. GOLIGHTLY
CHECKED WJG
SECT. MGR.
DATE COMPL. 2-26-76
EXAMINED
AUTHORIZED
DATE 2-26-76
CSD APPROVAL for R.L. HARRINGTON
TECH. APPROVAL NR

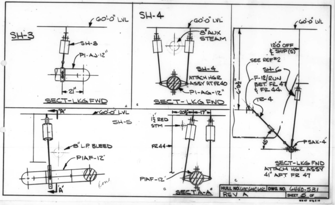
TITLE
PIPE HANGERS - MAIN STEAM SYSTEM - E.R.
FOR ARR DWG 6440-507

DWG. NO. 6440-531 REV C SHEET NO. OF

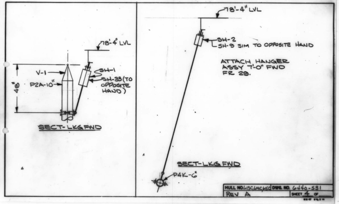
HULL 613C
TYPE OF DWG. 1


ELEVATION - STBD LKG INBD
P3AD-8"
SH-7
F-13 (ON REF #2)
F-10 (ON REF #2)
FR 44
60'-0" LVL

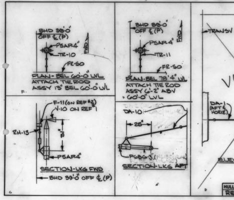
HULL NO. 613C, 614C, 615C DWG NO. 6440-531 REV.
REV A SHEET 6


SH-3
60'-0" LVL
SH-3
P1-AJ-12"
21"
SECT-LKG FWD
SH-4
60'-0" LVL
8" AUX STEAM
SH-4
ATTACH HGR ASSY AT FR 40
P1-AG-12"
SECT-LKG FWD
60'-0" LVL
12'-0" OFF ℄ SHIP (S)
SEE REF #2
SH-6
F-12/RUN BET. FR 47 & FR 44.
6'-9 1/2"
TR-4
45°
P5AK-4"
SECT-LKG FWD
ATTACH HGR ASSY 41" AFT FR 47
"A"
60'-0" LVL
SH-5
8" L.P. BLEED
PIAF-12"
1 1/2" RED STM
20 1/2"
17"
FR 44
PIAF-12"
SECT "A-A"

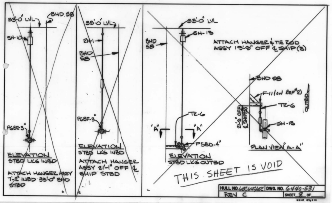
HULL NO. 613C, 614C, 615C DWG. NO. 6440-531
REV A SHEET 5 OF


78'-4" LVL
V-1
P2A-10"
48"
SH-1
SH-33 (TO OPPOSITE HAND)
SECT-LKG FWD
78'-4" LVL
SH-2
SH-9 SIM TO OPPOSITE HAND
ATTACH HANGER ASSY 7'-0" FWD FR 29.
P4K-6"
SECT-LKG FWD

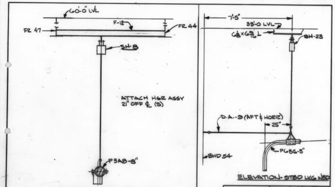
HULL NO. 613C, 614C, 615C DWG. NO. 6440-531
REV A SHEET 4 OF


BHD 39'-0" OFF ℄ (P)
P5AR-4"
TR-10
FWD
FR-50
PLAN - BEL 60'-0" LVL
ATTACH TIE ROD ASSY 13" BEL 60'-0" LVL
BHD 39'-0" OFF ℄ (P)
P5AR-4"
TR-11
FWD
FR-50
PLAN - BEL 78'-4" LVL
ATTACH TIE ROD ASSY 6'-2" ABV 60'-0" LVL
F-11 (ON REF #2)
V-10 ON REF #1
RH-13
31"
P5AR-4"
SECTION - LKG FWD
BHD 39'-0" OFF ℄ (P)
DA-10
25"
P6BG-3"
SECTION - LKG AFT
33'-0" LVL
TRANSV WEB 54
SH-11
VOID
DA-1 (AFT & HORIZ)
25"
P6BE-3"
ELEVATION - STBD LKG INBD

HULL NO. 613C, 614C, 615C DWG. NO. 6440-531
REV C SHEET 9 OF


33'-0" LVL
BHD 58
SH-10
P6BE-3"
ELEVATION
STBD LKG INBD
ATTACH HANGER ASSY 7'-2" INBD 39'-0" BHD STBD
33'-0" LVL
RH-1
BHD 58
P6BF-3"
ELEVATION
STBD LKG INBD
ATTACH HANGER ASSY 21'-1" OFF ℄ SHIP STBD
33'-0" LVL
SH-13
BHD 58
ATTACH HANGER & TIE ROD ASSY 19'-9" OFF ℄ SHIP (S)
"A"
"A"
TR-6
P5BD-4"
ELEVATION
STBD LKG OUTBD
BHD 58
F-11 (ON REF #2)
TR-6
21'-9" OFF ℄ SHIP (S)
OUTBD
SH-13
PLAN VIEW "A-A"
THIS SHEET IS VOID

HULL NO. 613C, 614C, 615C DWG. NO. 6440-531
REV C SHEET 8 OF


60'-0" LVL
F-12
FR 47
FR 44
SH-8
ATTACH HGR ASSY 21" OFF ℄ (S)
P3AB-8"
ELEVATION - STBD LKG OUTBD
7'-5"
33'-0 LVL
6 1/8 x 6 9/16 ⊥
SH-23
D.A.-9 (AFT & HORIZ)
25"
P6BG-3"
BHD 54
ELEVATION - STBD LKG INBD

HULL NO. 613C, 614C, 615C DWG. NO. 6440-531
REV A SHEET 7 OF

6440-531

MICRO-MASTER® 105 mm

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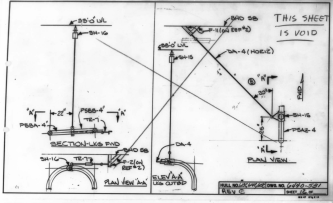
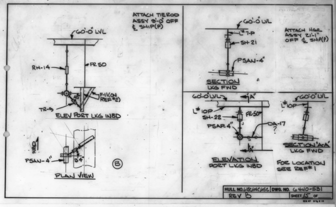
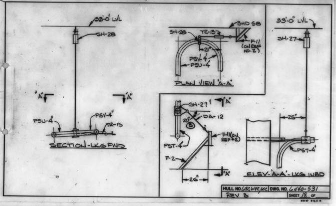
FRAME

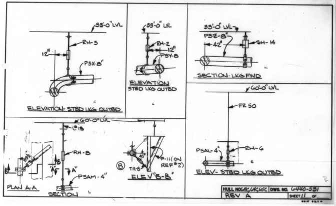
8X

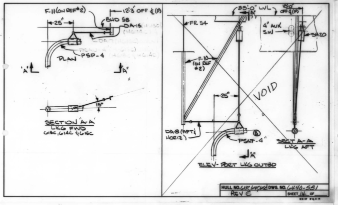

33'-0" LVL
SH-16
33'-0" LVL
SH-15
BHD 58
F-11 (ON REF #2)
DA-4 (HORIZ)
B "A"
20°
FWD
"A"
22"
PSBB-4"
"A"
PSBA-4"
TR-7
SH-15
PSAZ-4
25"
SECTION-LKG FWD
BHD 58
DA-4
"A"
SH-16
TR-7
F-2 (ON REF #2)
PLAN VIEW 'A-A'
ELEV 'A-A'
LKG OUTBD
PLAN VIEW
HULL NO. 613C, 614C, 615C
DWG. NO. 6440-531
REV C
SHEET 12 OF

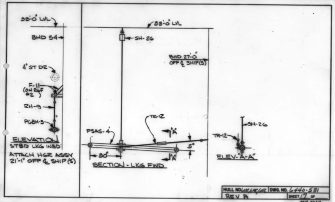
THIS SHEET IS VOID

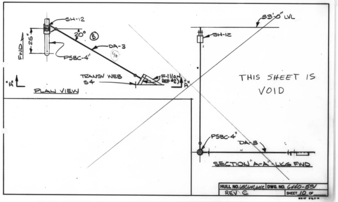

ATTACH TIEROD ASSY 3'-0" OFF ℄ SHIP (P)
60'-0" LVL
RH-14
FR 50
F-11 (ON REF #2)
45°
TR-9
ELEV PORT LKG INBD
INBD
PSAN-4"
34"
PLAN VIEW
B
60'-0" LVL
L 7-P
SH-21
ATTACH HGR ASSY 21'-1" OFF ℄ SHIP (P)
PSAN-4"
SECTION
LKG FWD
60'-0" LVL
"A"
60'-0" LVL
L #10P
L #10P
SH-22
FR 50
DA-17
PSAR-4"
"A"
SECTION "A-A"
LKG FWD
ELEVATION
PORT LKG INBD
FOR LOCATION SEE REF #1
HULL NO. 613C, 614C, 615C
DWG. NO. 6440-531
REV B
SHEET 15 OF


33'-0" LVL
SH-28
SH-28
TR-13
BHD 58
F-11 (ON REF NO. 2)
21"
PSV-4"
PSU-4"
PLAN VIEW "A-A"
33'-0" LVL
SH-27
"A"
"A"
PSU-4"
PSV-4"
TR-13
SECTION-LKG FWD
SH-27
"A"
DA-12
B
20°
25"
F-11 (ON REF #2)
PST-4"
PST-4"
F-2
"A"
26"
ELEV-"A-A"-LKG INBD
HULL NO. 613C, 614C, 615C
DWG. NO. 6440-531
REV B
SHEET 18 OF

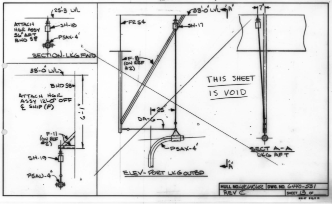

33'-0" LVL
RH-3
12"
P3X-8"
ELEVATION-STBD LKG OUTBD
33'-0" LVL
RH-2
12"
P3Y-8
ELEVATION
STBD LKG OUTBD
33'-0" LVL
P3Z-8"
42"
SH-14
SECTION-LKG FWD
60'-0" LVL
L #13
RH-8
"A"
"A"
PSAM-4"
B
PLAN A-A
SECTION
TR-8
45°
F-11 (ON REF #2)
ELEV "B-B"
60'-0" LVL
FR 50
PSAL-4"
RH-6
ELEV-STBD LKG OUTBD
HULL NO. 613C, 614C, 615C
DWG. NO. 6440-531
REV A
SHEET 11 OF


F-11 (ON REF #2)
12'-3" OFF ℄ (P)
25"
BHD 58
DA-15
PLAN
PSP-4
"A"
"A"
15°
SECTION "A-A"
LKG FWD
613C, 614C & 615C
33'-0" LVL
FR 54
15'-0" OFF ℄ (P)
4" AUX S.W.
SH-20
F-10 (ON REF #2)
25"
VOID
DA-8 (AFT & HORIZ)
PSAT-4"
B
"A"
ELEV-PORT LKG OUTBD
SECT A-A
LKG AFT
HULL NO. 613C, 614C, 615C
DWG. NO. 6440-531
REV C
SHEET 14 OF

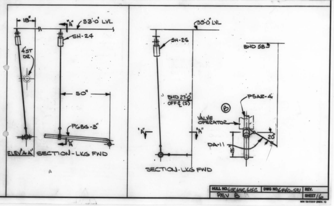

33'-0" LVL
BHD 54
4" ST DR
F-11 (ON REF #2)
RH-9
PGBH-3
ELEVATION
STBD LKG INBD
ATTACH HGR ASSY 21'-1" OFF ℄ SHIP (S)
33'-0" LVL
SH-26
BHD 27'-0" OFF ℄ SHIP (S)
TR-12
PSAS-4
"A"
30"
5°
"A"
SECTION-LKG FWD
TR-12
SH-26
ELEV-"A-A"
HULL NO. 613C, 614C, 615C
DWG. NO. 6440-531
REV A
SHEET 17 OF


SH-12
20°
B
25"
DA-3
FWD
PSBC-4"
TRANSV WEB 54
F-11 (ON REF #2)
"A"
"A"
PLAN VIEW
33'-0" LVL
SH-12
PSBC-4"
DA-3
SECTION "A-A"-LKG FWD
HULL NO. 613C, 614C, 615C
DWG. NO. 6440-531
REV C
SHEET 10 OF

THIS SHEET IS VOID


25'-3" LVL
ATTACH HGR ASSY 36" AFT BHD 58
SH-18
PSAX-4"
SECTION-LKG FWD
33'-0" LVL
BHD 58
ATTACH HGR ASSY 12'-0" OFF ℄ SHIP (P)
6'-1"
F-11 (ON REF #2)
SH-19
PSAU-4"
33'-0" LVL
"A"
FR 54
SH-17
F-10 (ON REF #2)
25"
DA-6
PSAX-4"
ELEV-PORT LKG OUTBD
"A"
7"
SECT A-A
LKG AFT
HULL NO. 613C, 614C, 615C
DWG. NO. 6440-531
REV C
SHEET 13 OF

THIS SHEET IS VOID


18"
"A"
33'-0" LVL
4" ST DR
SH-24
50"
PGBG-3"
"A"
ELEV "A-A"
SECTION-LKG FWD
33'-0" LVL
SH-25
BHD 58
BHD 27'-0" OFF ℄ (S)
B
PSAR-4"
VALVE OPERATOR
"A"
"A"
20°
DA-11
SECTION-LKG FWD
HULL NO. 613C, 614C, 615C
DWG NO. 6440-531
REV.
REV B
SHEET 16

6440-531

MICRO-MASTER 105 mm

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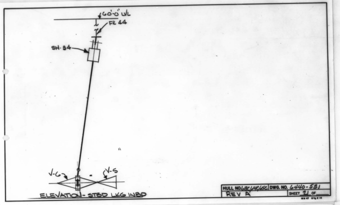
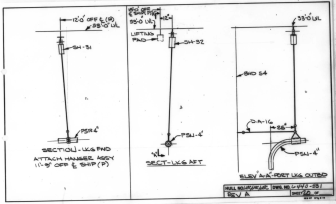
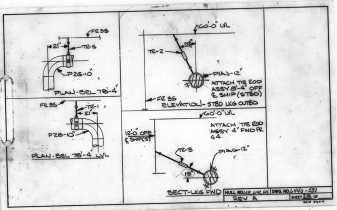
SEPT. '80

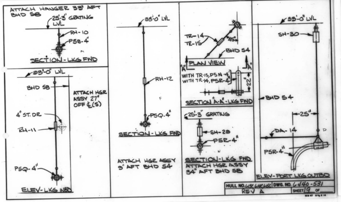
FRAME

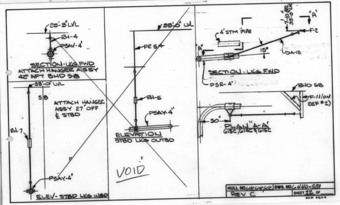
8X


60'-0" LVL
FR 44
SH-34
V-6
V-5
ELEVATION - STBD LKG INBD
HULL NO. 613C/614C/615C
DWG. NO. 6440-531
REV A
SHEET 21 OF


12'-0" OFF ℄ (P)
33'-0" LVL
SH-31
PSR 4"
SECTION - LKG FWD
ATTACH HANGER ASSY 11'-9" OFF ℄ SHIP (P)
18'-0" OFF ℄ SHIP (P)
"A"
33'-0" LVL
12"
LIFTING PAD
SH-32
PSN-4"
"A"
SECT-LKG AFT
33'-0" LVL
BHD 54
D.A-16
25"
PSN-4"
ELEV "A-A" - PORT LKG OUTBD
HULL NO. 613C/614C/615C
DWG. NO. 6440-531
REV A
SHEET 20 OF


FR 35
21"
TR-5
P26-10"
PLAN - BEL 78'-4"
FR 35
TR-1
21"
P28-10"
PLAN - BEL 78'-4" LVL
60'-0" LVL
TR-2
25½°
P1AJ-12"
ATTACH TIE ROD ASSY 8'-4" OFF ℄ SHIP (STBD)
FR 35
ELEVATION - STBD LKG OUTBD
60'-0" LVL
ATTACH TIE ROD ASSY 4" FWD FR 44.
12'-0" OFF ℄ SHIP (S)
TR-3
P1AG-12"
19°
SECT-LKG FWD
HULL NO. 613C, 614C, 615
DWG. NO. 6440-531
REV A
SHEET 23 OF


ATTACH HANGER 33" AFT BHD 58
25'-3" GRATING LVL
RH-10
PSS-4"
SECTION - LKG FWD
33'-0" LVL
BHD 58
ATTACH HGR ASSY 27" OFF ℄ (S)
4" ST. DR
RH-11
PSQ-4"
ELEV - LKG INBD
33'-0" LVL
RH-12
PSQ-4"
SECTION - LKG FWD
ATTACH HGR ASSY 9" AFT BHD 54
TR-14
TR-15
45°
BHD 54
PLAN VIEW
"A"
"A"
WITH TR-15, PSN-4"
WITH TR-14, PSR-4"
22"
SECTION "A-A" - LKG FWD
25'-3" GRATING
SH-29
PSR-4"
SECTION - LKG FWD
ATTACH HGR ASSY 34" AFT BHD 58
33'-0" LVL
SH-30
BHD 54
25"
DA-14
PSR-4"
ELEV - PORT LKG OUTBD
HULL NO. 613C, 614C, 615C
DWG. NO. 6440-531
REV A
SHEET 19 OF


25'-3" LVL
RH-4
PSAV-4"
SECTION - LKG FWD
ATTACH HANGER ASSY 42" AFT BHD 58
33'-0" LVL
58
ATTACH HANGER ASSY 27" OFF ℄ STBD
RH-7
PSAY-4"
ELEV - STBD LKG INBD
33'-0" LVL
FR 54
RH-5
PSAY-4"
ELEVATION
STBD LKG OUTBD
VOID
1'-10" BEL 33'-0" LVL
"A"
4" STM PIPE
F-2
15°
DA-13
"A"
SECTION - LKG FWD
PSR-4"
BHD 58
F-11 (ON REF #2)
30"
PLAN "A-A"
613C, 614C & 615C
HULL NO. 613C, 614C, 615C
DWG. NO. 6440-531
REV C
SHEET 22 OF

6440-531

MICRO-MASTER® 105 mm

K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

6440.541

CSD VAULT

E

REPRODUCTION OFFICE	
YARD PRINTS	YES
REMARKS	
GROUPING	YES
DATE	9-15-76
SIGNED	J. H. Johnson

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS					
REV.	A	A	A	A
SHEET	1	2	3	4

GROUP

MC NO.

NNS&DDCo. HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C	311	T11-S-116A	—
614C	310		
613C	309		

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
A	YES	YES	YES

APPROVALS

OWNERS NR

ABS

USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING

SCALE 1/2" =1 Ft.
DRAWN W.J.GOLIGHTLY
CHECKED W.J.G.
SECT. MGR. J.H. Johnson
TECH. APPROVAL NR

DATE COMPL. 9-15-6
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 9-15-76
CSD APPROVAL R. L. Harrington

HULL 613 KEY GROUP NO.

TYPE OF DWG. —

TITLE
PIPE HGRS- BOILER SATURATED STM & SUPERHTR CONTROL PIPING-ER- FOR ARR 6440-517

DWG. NO. 6440-541 REV. A SHEET NO. 1 OF 4

REVISIONS

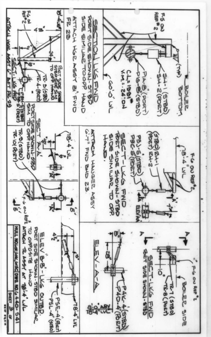
REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D.	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE	9/15/76		–	–

NOTES:

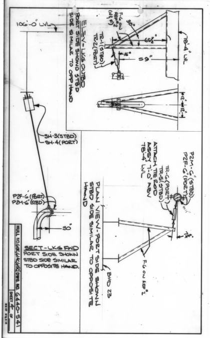
1. FOR KEY PLAN SHOWING LOCATION OF HANGERS IN SHIP, SEE REF# 1.
2. WHERE INDICATED, SUPPORTS, FOUNDATIONS AND REINFORCEMENTS ARE TO BE PROVIDED BY HULL DEPT.
3. HANGERS MAY BE MOVED (6" TO EITHER SIDE OF LOCATION SHOWN.) TO SUIT CONDITIONS ON SHIP EXCEPT THOSE COVERED BY NOTE#2.
4. MATERIAL IS GROUPED ON REF#2.
5. ALL WELDS TO BE 1/4" FILLET.

NO.	REFERENCES		DWG. NO.
2	↑	LIST	6440-518
1	PIPING ARR- BOILER SATURATED STEAM & SUPER HEATER CONTROL PIPING - ARR		6440-517

HULL NO. 613C, 614C, 615C DWG. NO. 6440-541 SHEET 2 OF



BOILER BOTTOM
(TYP)
F-5 ON REF#2
SH-1 (STBD)
SH-2 (PORT)
P1A-8" (PORT)
P1G-8" (STBD)
C.L.=1991#
V.M.=24" ON
60'-0" LVL
SECTION LKG FWD
PORT SIDE SHOWN-STBD SIDE SIMILAR TO OPP HAND
ATTACH HGR ASSY 31" FWD FR 23
F-6 ON REF#2
78'-4" LVL
(STBD) RH-1
(PORT) RH-2
P3J-5" (STBD)
P3C-5" (PORT)
ELEV "A-A"
SECT-LKG FWD
PORT SIDE SHOWN-STBD SIDE SIMILAR TO OPP. HAND.
ATTACH HANGER ASSY 6'-7" FWD BHD 23
F-6 ON REF#2
BOILER SIDE
TR-7 (STBD)
TR-8 (PORT)
10"
SECT-LKG FWD
PORT SIDE SHOWN-STBD
P4K-4" (STBD)
P4D-4" (PORT)
28"
8"
ELEV-A-A
3'-0" ABV 78'-4" LVL
78'-4" LVL
43"
24"
PORT SIDE SHOWN STBD SIDE SIM TO OPP HAND
TR-3 (STBD)
TR-4 (PORT)
F-6 ON REF#2
P3H-5" (STBD)
P3B-5" (PORT)
SECT-LKG FWD
ATTACH HGR ASSY 6" AFT FR 23
78'-4" LVL
SECT "A-A"
PORT SIDE SHOWN-STBD SIM. TO OPP HAND
TR-9 (STBD)
TR-10 (PORT)
F-6 ON REF#2
"B"
15°
4 1/2"
78'-4" LVL
P5E-4" (PORT)
P5L-4" (STBD)
ELEV "B-B"-LKG OUTBD.
PORT SIDE SHOWN-STBD SIMILAR TO OPPOSITE HAND
ATTACH TR ASSY AT 78'-4" LVL
HULL NO. 613C, 614C, 615C DWG. NO. 6440-541
SHEET 3 OF



78'-4" LVL
12" 12"
30°
66 1/2"
59"
15°
F-6 ON REF#2 (W&F)
TR-1 (STBD)
TR-2 (PORT)
ELEV-LKG OUTBD
PORT SIDE SHOWN STBD SIDE SIMILAR TO OPP HAND
P2M-6" (STBD)
P2F-6" (PORT)
TR-6 (PORT)
TR-5 (STBD)
ATTACH TIE ROD ASSY 7'-0" ABV 78'-4" LVL
F-6 ON REF#2
BHD 23
PLAN VIEW-PORT SIDE SHOWN STBD SIDE SIMILAR TO OPPOSITE HAND
106'-0" LVL
SH-3 (STBD)
SH-4 (PORT)
P2F-6" (PORT)
P2M-6" (STBD)
30"
SECT-LKG FWD
PORT SIDE SHOWN STBD SIDE SIMILAR TO OPPOSITE HAND.
HULL NO. 613C, 614C, 615C DWG. NO. 6440-541
SHEET 4 OF

6440-541

MICRO-MASTER® 105 mm

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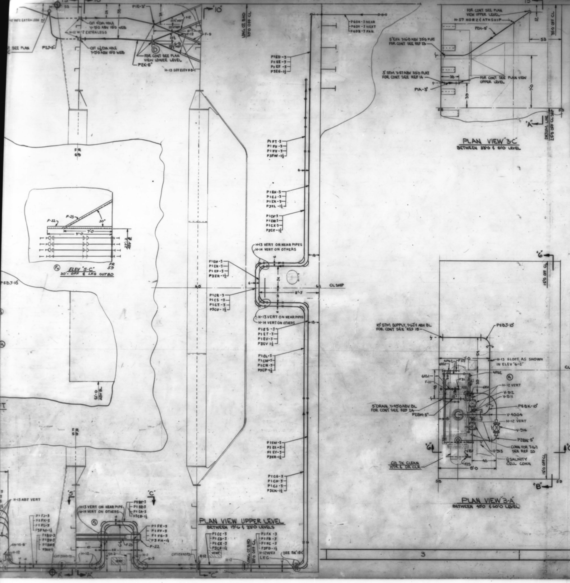
SEPT. '80

FRAME

8X


PLAN VIEW "3-C"
BETWEEN 33'0 & 51'0 LEVEL
FOR CONT SEE PLAN VIEW UPPER LEVEL
H-57 HORZ & ATHSHIP
P2H-5"
5" EXH Y-16'-0 ABV 33'0 FLAT FOR CONT SEE REF 23
5" STM Y-57 ABV 33'0 FLAT FOR CONT SEE REF 14
FOR CONT SEE PLAN VIEW UPPER LEVEL
P1A-3"
P6DX-3 NEAR
P6DY-3 NEXT
P6DZ-3 FAR
DATUM LINE 25'0 OFF CL SHIP
30'0 OFF CL
"A"
"13"
PLAN VIEW "3-A"
BETWEEN 48'0 & 60'0 LEVEL
10" STM SUPPLY, Y-62'-1 ABV BL FOR CONT SEE REF 15
P5BJ-10"
H-13 SLOPE AS SHOWN IN ELEV "6-C"
CL SHIP
H-12 VERT
V-912
V-911
P5BK-10"
V-4004
V-914
P2BN-5"
CONN FOR T-167 SEE REF 20
V-913
1½ SALINITY CELL CONN
5" DRAIN, Y-45'0 ABV BL FOR CONT SEE REF 24
P2BM-5"
CO TK CLEAN HTR & DR CLR
15'0 OFF CL
"6"
"B"
"C"
ELEV "5-C"
30'-OFF ℄ LKG OUTBD
PLAN VIEW UPPER LEVEL
BETWEEN 15'6 & 33'0 LEVELS
H-13 VERT ON NEAR PIPES
H-14 VERT ON OTHERS
CL SHIP

REVISIONS CONT.

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHO	OWNER DATE	OWNER APPD
F	6B 6C	1) ALTERED DET. P2BN-5, CONN. TO C.O. TK.CLN. HTR. WAS 4". 2) ADDED F-22 (LOCKING DEVICE) TO V-1133. ALL OF THE ABOVE TO SUIT DESIGN DEVELOPMENT				
	5A & 6-C	3) ADDED ELEV "5-C" & F-22 & F-23. WORK ON 613C PREV. ACCOMP. ON LIAISON LWC NO. 7. JGB KON	7/7/78	LWC		
G	14A 14C 10C	IN PARTIAL ELEVATION "14-C", PART. PLAN "14-A" / SECTION "10-C" & LABELING OF DETAILS P4DE-1½, P4FX-1½, P3EB-1½, P4FY-1½ / P3EC-1½ CORRECTED. IN SECTION "10-C" PIPES P4DE-1½ / P4EA-1½ RELOCATED. P4FX/P4FY WERE P4DE / P4EA RESP.	8/28/78	LWC		
H	3A 6C 6B	1) PLAN VIEW 3-A, ELEV 6-C & SECT 6-B, ALTERED PIPE TO AGREE WITH THE VENDOR CONNECTIONS ON THE CARGO TANK CLEANING HEATER. WORK COMP. ON H613C BY LIAISONS LWC NO. 45 & 90.				
	8C 8D 11A	2) PLAN VIEW LOWER LEVEL, ELEVATION "8B", ALTERED TO ALLOW REMOTE OPERATION OF DRAIN SYSTEM ON THE STRIPPING PUMP. WORK ACCOMP ON H613C BY LIAISON NO. JHS-111 JGB	4/23/79	LWC		

ABS LTR DTD 3/6/78
USCG LTR DTD 12/19/77

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHO	OWNER DATE	OWNER APPD
A	—	INITIAL ISSUE	☒	☒	☒	☒
B		SLOP TANK HEATING COIL SUPPLY AND RETURN PIPING ALTERED TO SUIT DESIGN DEVELOPMENT. NOTE 10 & REF 25 ADDED JWS	7/13/77	LWC		
C	11C 14B 14C 14A 14C 4D	IN SECTION "11-C" DET. P3DC, P3DD & P4DE ALTERED TO SUIT REF 13. PARTIAL PLAN "14-A" & PARTIAL ELEVATION "14-B" ALTERED TO SUIT. IN PARTIAL PLAN "14-A" P6DU-3, P6DV-3 & P6DW-3 ALTERED TO SUIT DESIGN DEVELOPMENT. IN PARTIAL ELEVATION "14-C" P6DX-3, P6DY-3 & P6DZ-3 ALTERED. IN PLAN VIEW UPPER LEVEL P1ED-3, P1EE-3 & P1EF-3 ALTERED. ALL TO SUIT DESIGN DEVELOPMENT JWS				
	7D 8C	ADDED STEAM DRAINS TO CARGO STRIPPING PUMP. ALL TO SUIT DESIGN DEVELOPMENT. JGB	9/15/77	LWC		
D	ALL 6B 8B 10A 14A	ADDED HANGERS AND HANGER FOUNDATIONS THROUGHOUT DRAWING. SK-1, SK-2 & SK-3 ADDED IN SECTION "6-B" AIR CONN FOR V-911 & F-2 ADDED. IN ELEV "8-B" AIR CONN FOR V-1493 & 1520 ADDED IN SECTION "10-A" AIR CONN FOR V-150 & V-275 ADDED. REF 26 ADDED. IN PARTIAL PLAN "14-A" P2DF-2, P2DG-2, P2DH-2, P2DJ-2 P2DK-2, P2DL-2, P2DM-2, P2DN-2, P2DP-2, P2DR-2, P2DS-2, P2DT-2 P4DE-1½ & P4EA-1½ ALTERED TO SUIT DESIGN DEVELOPMENT. P4FX-1½ & P4FY-1½ ADDED.				
	4D TO 10A	P2N-5 ALT TO CLEAR FOUL WITH STRIPPING PUMP. PLAN VIEW UPPER LVL, PLAN VIEW LOWER LVL, SECT 10-A ALT TO SUIT. JGB	12/13/77	LWC	3/14/78	LTR 1943V
E	6-B — 3A	ALTERED DET P5BL-10, CONN TO C.O. TK.CLN HTR TO SUIT DESIGN DEVELOPMENT. IN PLAN VIEW LOWER LEVEL CONN FOR G-18 ADDED TO DET. P2M-5. ALTERED DET P2BN-5 TO SUIT PLAN CORRECTION JWS	3/27/78	LWC		
F	14C	ALTERED HOLE CUT SIZE FROM 3⅟32 TO 2 15/32 AT BHD 61 IN PARTIAL ELEVATION "14-C". MED				
		FOR CONT. REV. F SEE "2-D"				

AUTHORITY:

GENERAL NOTES:

1. THIS DRAWING DEVELOPED IN ACCORDANCE WITH REF NO 1,2,3,4,8 & 10.
2. ALL WELDING TO BE DONE BY QUALIFIED WELDERS IN ACCORDANCE WITH ABS, USCG RULES & REF NO. 11.
3. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS: BUTT WELDS TYPE P-8 SOCKET WELDED TYPE P-14 AND BHD PENETRATION TYPE P-17A & P17 ON REF NO 11, EXCEPT AS OTHERWISE NOTED.
4. BACKING RINGS ORDERED IN LIST OF MAT'L ARE TO BE USED AS REQUIRED SEE NOTE 3, SHIP CLOSING JOINTS ARE INDICATED THUS ╪.
5. PIPE HANGERS ARE IN ACCORDANCE WITH REF NO 12 AND ARE ORDERED IN LIST OF MAT'L.
6. BENDING RADII FOR ALL PIPING TO BE (5) TIMES THE NOMINAL IPS.
7. "Y" DIMENSIONS DENOTES VERTICAL DISTANCE FROM THE BASE LINE TO THE CENTER LINE OF PIPE RUN. "X" DIMENSIONS DENOTES VERTICAL DISTANCE FROM THE UNDERSIDE OF DECK OR PLATING OVER TO THE CENTER LINE OF PIPE.
8. ALL DIMENSIONS ARE FROM THE NEAR SIDE OF THE STRUCTURE TO THE CENTER LINE OR END OF THE PIPE UNLESS OTHERWISE NOTED.
9. ALL HOLE CUTS ARE PROVIDED ON STRUCTURAL DRAWINGS UNLESS OTHERWISE NOTED IN BODY OF PLAN.
10. Ⓑ BANK PIPING IN THE PLAN VIEWS HAS BEEN LABELED SO THAT THE ORDER IN WHICH THE DETAILS HAVE BEEN ARRANGED FROM TOP TO BOTTOM CORRESPONDS TO THE ORDER OF THE PIPES NEAR TO FAR.

	NO.	REFERENCES	DWG NO.
Ⓓ	26	PIPING ARR-COOLING WATER, COMPRESSED AIR FOR VAC STRIP SYSTEM/OILY WATER SAMPLING IN CARGO PUMP RM	6550-440
Ⓑ	25	PIPING ARR. SLOP TK. HTG. COIL DRS. SYS. ENG. RM. PLAN, SECT. & ELEV.	6555-481
	24	PIPING ARR AUX CONDENSATE SYS PLAN SECT & ELEV	6552-410
	23	PIPING ARR - STRIPPING PUMP EXHAUST IN ENG RM PLAN, SECT & ELEV	6451-488
	22	PIPE DETAILS SLOP TK H.C. RETURNS & DRN COOLER RETURNS IN CARGO PUMP RM	6552-453
	21	LIST OF PRESS & VAC GAGES FURNISHED BY SHIPYD	6750-483
	20	LIST OF THERM FURNISHED BY SHIPYD	6750-482
	19	DIAGRAM CONDENSATE, RES & MAKE-UP FD SYS ARR	6552-380
	18	DIAGRAM AUX EXHAUST, LP BLEED STEAM & RELIEF VALVE ESCAPE - ARR	6451-471
	17	PIPING ARR 220 PSI CONTAMINATED STM SYS ENG RM - PLAN, SECT, & ELEV	6460-703
	16	PIPING ARR 125 PSI CONTAMINATED STM SYS ENG RM - PLAN, SECT ELEV	6450-743
	15	PIPING ARR RED PRESS STM	6450-740
	14	PIPING ARR BOILER PRESS AUX STM - PLAN, SECT & ELEV	6450-737
	13	PIPING ARR HEATING COILS IN SLOP TANK	2750-11
	12	STD PIPE HANGERS & INSTALLATION INSTALLATION	257056
	11	FAB & WELDING INSTRUCTIONS FOR CL I & II PIPING	257036
	10	PAINTING SCHEDULE	8300-40
	9	ARR SEA CHEST IN AFT PUMP ROOM	6000-314
	8	PIPING ARR CARGO OIL & SEGREGATED BALLAST SYS IN CARGO PUMP ROOM PLAN & SECTIONS	2600-79
	7	PIPE DETAILS EXHAUST IN CARGO PUMP ROOM	6451-462
	6	PIPE DETAILS STEAM IN CARGO PUMP ROOM	6460-681
	5	PIPING ARR STEAM & EXHAUST IN CARGO PUMP ROOM L/M	6450-680
	4	DIAGRAM AUX STEAM SYS ARR	6450-683
	3	DIAGRAM AUX STEAM SYS L/M	6450-684
	2	DIAGRAM CONTAMINATED STEAM GENERATING SYSTEM LIST	6460-683
	1	DIAGRAM CONTAMINATED STEAM GENERATING SYSTEM ARR	6460-682

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
61AC	310	
613C	308	

APPROVALS
OWNERS LTR 1170V DTD 10-25-76
ABS LTR 78-2 DATED 11-30-76
USCG LTR DATED 10-12-76

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPT.
FSCM NO. 43689

SCALE 3/8" = 1 FT
DRAWN E.P. WEBB
CHECKED E.J. Kelly
SECT MGR L.W. Chadwell
DATE COMPL. 8-6-76
EXAMINED
AUTHORIZED —
DATE 8-5-76
TECH APPROVAL
C S D APPROVAL R. H. Harrington

PIPING ARR STEAM & EXHAUST IN CARGO PUMP ROOM

U S M A DESIGN T11-S-16A
U S M A DWG NO.
HULL NO.
DWG NO. 6450-679
REV H
SHEET NO. 1 OF 1

DWG. REV — HULL APPLIC.

REV						
A	YES	YES				
B	YES	YES				
C	YES	YES				
D	YES	YES				
E	YES	YES				
F	YES	YES				
G	YES	YES				
H	YES	YES				

REPRODUCTION OFFICE
YARD PRINTS 4ED GROUPING —
REMARKS REV "H"
DATE 4-27-79 SIGNED L.W. Chadwell

GROUP:
MC NO.

6450-679

MICRO-MASTER 105 mm
K+E
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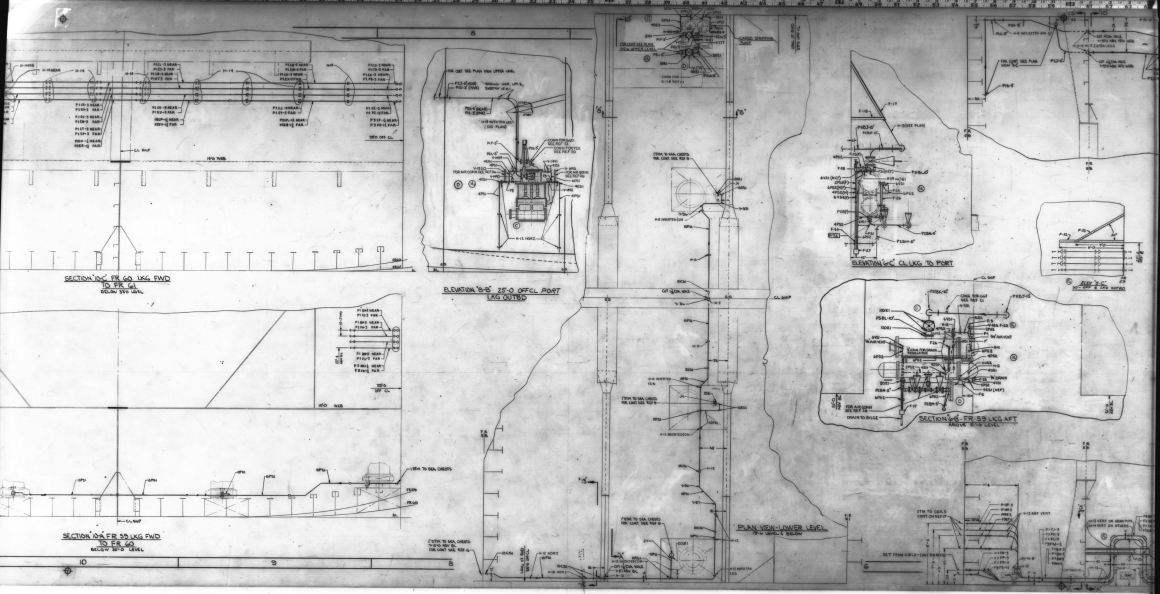
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 1
10X



8
10
9
8
CL SHIP
15'0 WEB
35'0 OFF CL
FOR CONT SEE PLAN VIEW UPPER LEVEL
H-12 HORZ
CONN FOR G-118 REF 21
CARGO STRIPPING PUMP
LONG. OT BHD 33'0 OFF CL
1" STM TO SEA CHESTS FOR CONT SEE REF 9
H-12 INVERTED (DN)
CUT 1½ DIA HOLE
FOR AIR CONN SEE REF 26
DRAIN TO BILGE
STM TO COILS CONT ON REF 17
RET FROM COILS-CONT ON REF 17
1 STM TO SEA CHESTS
FR 60
FR 61
FR 59
BL

SECTION "10-C" FR 60 LKG FWD TO FR 61
BELOW 33'0 LEVEL

ELEVATION "8-B" 25'-0 OFF CL PORT LKG OUTBD

ELEVATION "6-C" CL LKG TO PORT

ELEV "5-C"
30'- OFF ℄ LKG OUTBD

SECTION "6-B" FR 59 LKG AFT
ABOVE 51'-0 LEVEL

SECTION "10-A" FR 59 LKG FWD TO FR 60
BELOW 30'-0 LEVEL

PLAN VIEW-LOWER LEVEL
15'-6 LEVEL & BELOW

6450-679

MICRO-MASTER 105 mm

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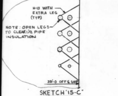
SEPT. '80

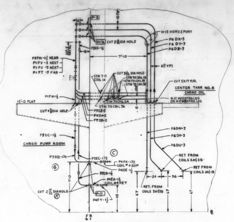
FRAME 2

10X

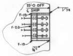
15 14 13 12 11


H-13 WITH EXTRA LEG (TYP)
NOTE: OPEN LEGS TO CLEAR 1/2 PIPE INSULATION
39'-0 OFF ℄ SHIP

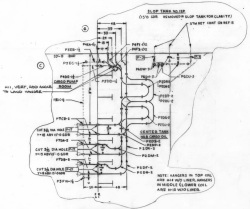
SKETCH "15-C"
LKG FWD
Ⓓ


P-3
H-13 HORZ ℄ PORT
P6DA-3
P6DY-3
P6DB-3
CUT 3 3/8 DIA HOLE
P3FW-1 1/2 NEAR
P1FV-3 NEXT
P1FU-3 NEXT
P1FT-3 FAR
STM TO COIL 1A
STM TO COIL 1B
STM TO COIL 3B
CUT 5X17 F.O.
CENTER TANK NO. 8 CARGO OIL
H-12 W/EXTRA LEG OR H-11 W/EXTRA LEG
15'-0 FLAT
CUT 4 3/4 DIA HOLE
STM TO COIL 2A
STM TO COIL 3A
P7CR-2
P7DA-2
P7DB-2
P6DW-3
P6DV-3
P6DU-3
P3DC-1 1/2
CARGO PUMP ROOM
P3DD-1 1/2
P3EC-1 1/2
P4FX-1 1/2
COIL # 4 SUP
P4DE-1 1/2
P3EB-1 1/2
P4EA-1 1/2
COIL # 4 RET
RET FROM COILS 2A & 2B
RET FROM COILS 1A & 1B
RET. FROM COILS 3A & 3B
P-17
P4FY-1 1/2
CUT 2 DIA HOLE
FR 61
Ⓒ
Ⓖ

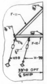
PARTIAL ELEVATION "14-C"
20'-0 OFF ℄ PORT LOOKING OUTBD.


39'-0 OFF ℄ SHIP
F-19
F-20
F-19

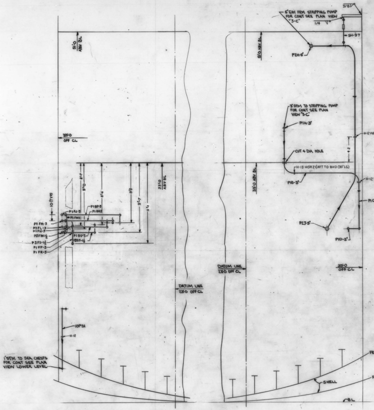
SKETCH "15-B"
LKG FWD
Ⓓ


SLOP TANK NO. 13P
(15'-0 GDR. REMOVED IN SLOP TANK FOR CLARITY)
STM RET CONT ON REF 13
P4EA-1 1/2
P3EB-1 1/2
39'-0 BHD
P3EC-1 1/2
P4FZ-1 1/2
P4FX-1 1/2
P-3
P6DW-3
P6DV-3
P6DU-3
P4DE-1 1/2
CARGO PUMP ROOM
H11, VERT, ADD ANGLE TO LAND HANGER
P3DD-1 1/2
P3DC-1 1/2
P2DR-2
P2DB-2
P2DT-2
P2DL-2
P2DG-2
P2DJ-2
P7CR-2
CUT 3 3/8 DIA HOLE Y=18 ABV 15'-0 GDR
P7DA-2
CUT 3 3/8 DIA HOLE Y=13 ABV 15'-0 GDR
P7DB-2
CUT 3 3/8 DIA HOLE Y=8 ABV 15'-0 GDR
P3FW-1 1/2
CENTER TANK NO. 8 CARGO OIL
P2DS-2
P2DP-2
P2DM-2
P2DF-2
P2DN-2
P-17
NOTE: HANGERS IN TOP COIL ARE H-14 W/O LINER. HANGERS IN MIDDLE & LOWER COIL ARE H-12 W/O LINER.
FR 61
Ⓒ
Ⓖ

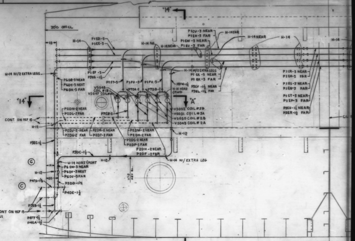
PARTIAL PLAN "14-A" Ⓓ
13'-6 ABL & BELOW


F-11
F-10
H-39
39'-0 OFF ℄ SHIP

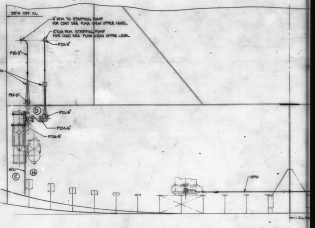
SKETCH 15-A
LKG AFT
Ⓓ


5" EXH FRM STRIPPING PUMP FOR CONT SEE PLAN VIEW "3-C"
SH-97
51'-0 ABV BL
P2H-5"
3" STM TO STRIPPING PUMP FOR CONT SEE PLAN VIEW "3-C"
P1A-3"
H-12 W/2 EXTRA LEGS
CUT 4 DIA HOLE
H-13 HORZ (AFT TO BHD (30" LG)
P1B-3"
H-12 W/EXTRA LEG
P1C-3"
P2J-5"
P1D-3"
35'-0 OFF CL
DATUM LINE 23'-0 OFF CL
P1FK-3
P1FL-3
P1FJ-3
P3FM-1 1/2
P1FP-3
P1FR-3
23'-0 ABV BL
38'-0 ABV BL
35'-0 OFF CL
10PS1
H-12
1" STM TO SEA CHESTS FOR CONT SEE PLAN VIEW LOWER LEVEL
FR 58
SHELL
BL

SECTION "13-A" - FR 59 LKG AFT
BELOW 51'-0 LEVEL


"14"
35'-0 OFF CL
H-14
H-14 W/2 EXTRA LEGS
H-14 NEAR
H-14 FAR
P1CU-3 NEAR
P1EH-3 FAR
P1CW-3 NEAR
P1EJ-3 FAR
H-14 W/EXTRA LEGS
P1CR-3 NEAR
P1EM-3 FAR
P1ES-3 NEAR
P1EN-3 FAR
P1GT-3 NEAR
P1EP-3 FAR
P3CU-1 1/2 NEAR
P3ER-1 1/2 FAR
P6DE-3 NEAR
P6DX-3 NEXT
P6DK-3 FAR
V5052 COIL # 2B
V5051 COIL # 3A
V5050 COIL # 2B
V5049 COIL # 2A
"A"
CONT ON REF 13
H-12
P2DJ-2 NEAR
P2DG-2 FAR
P2DM-2 NEAR
P2DN-2 FAR
P2DS-2 NEAR
P2DF-2 FAR
P2DH-2 NEAR
P2DF-2 FAR
H-14 W/EXTRA LEG
P3DC-1 1/2
H-14 HORZ ℄ PORT
P6DW-3 NEAR
P6DV-3 NEXT
P6DU-3 FAR
P4FX-1 1/2
P3DD-1 1/2
P4DE-1 1/2
P3EB-1 1/2
P4FY-1 1/2
P4EA-1 1/2
"C"
Ⓒ
Ⓖ

SECTION "10-C" FR 60 L[illegible]
TO FR 61
BELOW 35'-0 LEVEL


35'-0 OFF CL
3" STM TO STRIPPING PUMP FOR CONT SEE PLAN VIEW UPPER LEVEL
5" EXH FRM STRIPPING PUMP FOR CONT SEE PLAN VIEW UPPER LEVEL
P2K-5"
P1E-3"
FOR AIR CONN SEE REF 26
P1F-3"
P2L-5"
P2M-5"
P2N-5"
4PS1
Ⓓ
Ⓗ
Ⓒ
CL

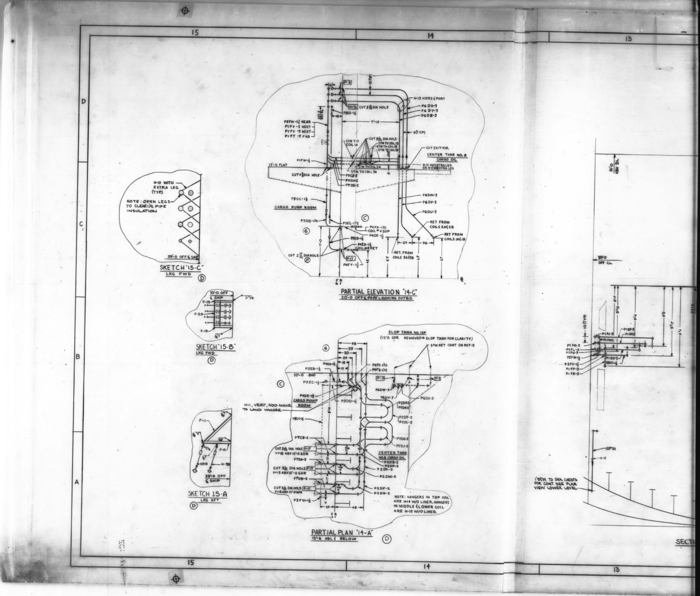
SECTION "10-A" FR 59 LKG
TO FR 60
BELOW 30'-0 LEVEL

15 14 13 12 11 10

6450-679

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 3
10X


15
14
13
D
C
B
A
H-13 WITH EXTRA LEG (TYP)
NOTE: OPEN LEGS TO CLEAR 1½ PIPE INSULATION
39'-0 OFF ℄ SHIP
SKETCH "15-C"
LKG FWD
D
39'-0 OFF ℄ SHIP
F-19
F-20
F-19
SKETCH "15-B"
LKG FWD
D
F-11
F-10
H98
H-99
39'-0 OFF ℄ SHIP
SKETCH 15-A
LKG AFT
D
P-3
P17A CUT 3 3/32 DIA HOLE
P3EG-1½
P3FW-1½ NEAR
P1FV-3 NEXT
P1FU-3 NEXT
P1FT-3 FAR
7'-10
6 (TYP)
H-13 HORZ ℄ PORT
P6DX-3
P6DY-3
P6DZ-3
STM TO COIL 1A
CUT 3 3/32 DIA HOLE
STM TO COIL 2B
STM TO COIL 1B
STM TO COIL 3B
STM TO COIL 2A
STM TO COIL 3A
CUT 5X17 F.O.
CENTER TANK NO. 8
CARGO OIL
H-12 W/EXTRA LEG OR H-11 W/EXTRA LEG
P1FW-1½
15'-0 FLAT
CUT 4 3/8 DIA HOLE
P7CZ-2
P7DA-2
P7DB-2
P3DC-1½
CARGO PUMP ROOM
P6DW-3
P6DV-3
P6DU-3
P3DD-1½
P3EC-1½
C
G
P4FX-1½ COIL #4 SUP
P4DE-1½
P3EB-1½
P4EA-1½ COIL #4 RET
RET FROM COILS 2A & 2B
RET FROM COILS 1A & 1B
RET. FROM COILS 3A & 3B
CUT 2 15/32 DIA HOLE
F
P-17
P4FY-1½
24
36
67
43
7'-0
FR 61
PARTIAL ELEVATION "14-C"
20'-0 OFF ℄ PORT LOOKING OUTBD.
SLOP TANK NO. 12P
(15'0 GDR. REMOVED IN SLOP TANK FOR CLARITY)
STM RET CONT ON REF 13
48
39
30
24
18
17
P4EA-1½
P3EB-1½
P4FY-1½
P4FX-1½
39'-0 BHD
P3EC-1½
P4DE-1½
CARGO PUMP ROOM
H11, VERT, ADD ANGLE TO LAND HANGER
P3DD-1½
P3DC-1½
9'-10
P-3
P6DW-3
P6DV-3
P6DU-3
P2DR-2
P2DN-2
P2DT-2
P2DL-2
P2DG-2
P2DJ-2
P7CZ-2
CUT 3 3/32 DIA HOLE P-17
Y=18 ABV 15'-0 GDR
P7DA-2
CUT 3 3/32 DIA HOLE P-17
Y=13 ABV 15'-0 GDR
P7DB-2
CUT 3 3/32 DIA HOLE P-17
Y=8 ABV 15'-0 GDR
P3FW-1½
CENTER TANK NO. 8 CARGO OIL
P2DS-2
P2DP-2
P2DK-2
P2DM-2
P2DF-2
P2DH-2
NOTE: HANGERS IN TOP COIL ARE H-14 W/O LINER. HANGERS IN MIDDLE & LOWER COIL ARE H-12 W/O LINER.
6
24
48
FR 61
PARTIAL PLAN "14-A"
19'-6 ABL & BELOW
D
5'-0 ABV BL
39'-0 OFF CL
P1FN-3
P1FL-3
P1FM-1½
P3FS-1½
P1FP-3
P1FR-3
P1BP-3
P1BR-2
10PS1
H-12
1" STM TO SEA CHESTS FOR CONT SEE PLAN VIEW LOWER LEVEL
SECTI

6450-679

MICRO-MASTER 105 mm

K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 4

10X

6430-680

MICRO-MASTER® 105 mm

K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

6450-680 CSD VAULT
E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS Partial Issue For Rev "J"
GROUPING YES
DATE 5-11-79
SIGNED L.W. Creswell

YARD PRINTS
ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS																										
REV.	H	D	A	F	A	C	C	F	H	G	C	C	C	C	H	A	E	A	C	C	C	C	F	G	C	G
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
REV.	F	G	E	C	H	E	H	F	G	F	H															
SHEET	27	28	29	30	15A	4A	8A	16A	20A	25A	2A															

GROUP SEE GROUP SHTS
MC NO. —

NNS&DDCo. HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614	310	↓	
613	308	T11-S-116A	

DWG. REV. — HULL APPLIC.

REV.	613C	614C
A	YES	YES
B	YES	YES
C	YES	YES
D	YES	YES
E	YES	YES
F	YES	YES
G	YES	YES
H	NO	YES
J	NO	YES

APPROVALS
OWNERS LTR 1170V DTD 10-25-76
ABS LTR. T8-2 DATED 11-30-76
USCG LTR DATED 10-12-76

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING DEPT

SCALE NTS =1 Ft.
DRAWN E P WEBB
CHECKED E.W. KELLY
SECT. MGR. L.W. Creswell
DATE COMPL. 8-6-76
EXAMINED E.S. Stephenson
AUTHORIZED —
DATE 8-5-76
TECH. APPROVAL Not Req'd
CSD APPROVAL R.L. Harrington

HULL 613C

TYPE OF DWG. WORKING DRAWING

TITLE
PIPING ARR STEAM & EXHAUST IN CARGO PUMP ROOM L/M

DWG. NO. 6450-680 REV J SHEET NO. 1 OF

REVISIONS

REV.	SHEET	DESCRIPTION	NNS&DDCo. DATE	AUTH'D	OWNER DATE	APPD.
A	—	INITIAL ISSUE				
B	9,11	ALT'D: S/M WAS PO 2600-C38 (59) LAM				
C	6	LINES 1 THRU 8 & LINE 12 DELETED	7/30/77	LWC		
	7	LINES 1 THRU 6 & LINE 12 DELETED				
	10	LINES 1 THRU 6 DELETED				
	11	LINES 1,2 & 3 DELETED				
	12	LINES 1 THRU 10 & LINE 13 DELETED				
	13	LINES 1,2, & 3 DELETED				
	14	LINES 1 THRU 6 & LINE 12 DELETED				
	19	LINES 1,2 & 3 DELETED				
	20	ADDED				
	21	ADDED				
	22	ADDED				
	23	ADDED				
	24	ADDED				
	25	ADDED				
	26	ADDED				
	27	ADDED				
	28	ADDED				
	29	ADDED				
	30	ADDED				
	4	LINE 17: S/M WAS 6451-M3 (24)				
	15	LINE 18: S/M WAS 6950-M5 (11) JWS				
D	15A	ADDED. AES JGB	10/25/77	LWC	3/4/78	LTR 1942V
E	4	LINES 7-9, & 11-16 ADDED	12/22/77	LWC		
	4A	ADDED				
	8A	ADDED				
	16A	ADDED				
	17	LINES 12-15 ADDED				
	20A	ADDED				
	23	LINES 4-9, 12-14 & 7 & 18 ADDED				
	24	LINES 5-9 ADDED				
	25A	ADDED				
	27	LINES 6,7,8 & 10 ADDED				
	28	LINES 2,5 & 6 ADDED				
	29	LINES 5 & 6 ADDED JWS				

ABS 3-6-78
USCG

REVISIONS CONT ON SHT 2A

NO.	REFERENCES	DWG. NO.
3	PIPE DETAILS SLOP TK H.C. RETURNS & DRN COOLER RETURNS IN CARGO PUMP RM	6552-453
2	PIPE DETAILS STEAM IN CARGO PUMP ROOM	6450-681
1	PIPING ARR STEAM & EXHAUST IN CARGO PUMP ROOM	6450-679

HULL NO. 613C, 614C DWG. NO. 6450-680 REV E SHEET 2 OF

REVISIONS

REV.	SHEET	DESCRIPTION	NNS&DDCo. DATE	AUTH'D	OWNER DATE	APPD.
F	4	LINE 13 S/M WAS 57-10-104	3/29/78	LWC		
		15 57-10-105 LENGTH WAS 54"				
	16-A	8 57-10-104 LENGTH WAS 54"				
	20A	8 57-10-102				
		9 57-10-103				
	23	12 57-10-103				
		13 57-10-102				
		14 57-10-102				
	24	9 57-10-102				
	25A	7 57-10-102				
		8 57-10-103				
	27	11 57-10-103				
		12 57-10-102				
	24	8 SHT 6F				
	28	6 SHT 6F				
	8	1 PMO 6552-453				
		2 PMO 6552-453 JWS				
G	8A	LINE 6 ADDED	7/7/78	LWC		
	9	LINES 1,2, & 3 DELETED				
		LINES 4,5 & 6 ADDED JWS				
	15A	LINES 13 & 14: S/M WAS P.O. 6555-C12 (1)				
	20A	LINES 14 & 15: ADDED (MAT'L ON 613C ON LWC-NO 7)				
H	8A	LINES 7-18, ADDED	4/27/79	LWC		
	9	LINES 7-9, ADDED				
	15	LINE 18, S/M WAS 6550-C49 (1)				
	15A	LINE 2, ADDED LINE 5, DESCRIPTION WAS 3/8"-90° ELL, C.S., ASTM-A105, THD, ANSI B16.11, 2000#, S/M WAS 25-09-102. LINE 7, DELETED LINES 8 & 9, QTY. WAS 2 LINE 10, ADDED LINE 15-18, DESCRIPTION WAS 3/8" GATE VLV, C.S., THD, 600# (VENDOR FURNISHED), S/M WAS PO 6350-T5 THE ABOVE WORK ACCOMP. ON H613C BY LIAISONS: LWC NO. 45, LWC NO. 90, & SHS NO. 111. JMN JGB				
J	8A	LINE 12: S/M WAS SHT. 4A, L. 14. JGB	5/11/79	LWC		

NO. REFERENCES DWG. NO.

HULL NO. 613C, 614C DWG. NO. 6450-680 REV. J SHEET 2A OF

NOTES:

1. FOR NOTES, REFERENCES AND ARRANGEMENT OF PIPING, SEE DWG 6450-679.
2. FOR PIPE DETAILS SEE DWG 6450-681, & 6552453

HULL NO. 613C, 614C DWG. NO. 6450-680 REV A SHEET 3 OF 1

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A		1	1	P2H-5"	5.563 O.D. x .258 THK STL BLK SCHED 40, ASTM-A53-73 GR B	PMO 6451-462	PS	
A		2	1	P2J-5"	↓	↓	↓	
A		3	1	P2K-5"				
A		4	1	P2L-5"				
A		5	1	P2M-5"				
A		6	1	P2N-5"				
E		7	1	F-13	3X3X3/8 ANGLE BAR 32" LG C.S. ABS GR A OR EQ	S/Y 73-05-246	PS	
E		8	1	SH-98	5" SPRING HGR. .2" UP	P.O. 6450 C-58 (2)	ST-PS	
E		9	1	SH-97	5" SPRING HGR .62 UP	PO 6450 C-58 (1)	↓	
A		10	3	50WS1	5" BACKING RING STL, ASTM-A109 FOR 5.563 O.D. X .258 THK PIPE	2600-C37 (13)	MD-PS	
E		11	1	H-57	5" SWING TYPE H-57 42" LG SPECIAL	M.O. 283124 SHT 6G, L6	ST-PS	
E		12	3	H-12	5" SWING TYPE H-12 DWG 257056	25-47-426		
F		13	6	F-13	EXTRA SUPPORT LEGS FOR 5" H-12 HGR. 1" X-HVY PIPE ASTM-A-53	25-50-623		
E		14	1	H-13	5" SWING TYPE H-13 HGR W/EXTRA LEG 257056	25-48-426	↓	
F		15	1	F-14	SUPPORT LEGS FOR 5" H-13 1 1/4 X-HVY PIPE 48" LG ASTM-A53	25-50-529	PS	
E		16	2	F-9	BRACE FOR 5" H-13 1 1/2 X-HVY PIPE ASTM-A53	S/Y 57-10-106	PS	
C		17	1	V-275	5" GATE C.S. ANSI B16.5 150# ASTM-A216 GR WCB	(2) 6450-C49	MD-PS	← 6451-C3 (24)
A		18	1	V-277	5" SWING CHK ↓	(26) 6450-M4		

REMARKS -

MC NO. - PS - 166

SERVICE - EXHAUST PIPING CARGO PUMP RM

GROUP NO. 6451-0201-1001 S1

APPLICABLE HULLS	613	614	DWG NO.	SHEET	REV.
	YES	YES	6450-680	4	F

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
E		1	2	F-12	2X1/4 FLAT BAR 2" LG C.S. ABS GR A OR EQ.	71-30-330	PS	
		2						
		3						
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - EXHAUST PIPING CARGO PUMP RM.

GROUP NO. 6451-0201-1001

APPLICABLE HULLS	613	614	DWG NO.	SHEET	REV.
	YES	YES	6450-680	4A	E

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	32	50Z1	5	BOLTS	3/4-10UNC-2A-3LG HEX-HD HVY	2600-C38 (55)	MD-PS	
	2	32			NUTS	3/4-10UNC-2B HEX HVY	2600-C38 (18)		
	3	4			GSKT	1/16 THK COMP ASBESTOS	2600-C39 (18)		
	4	—	(1)	3 1/2	BOLTS	NOT REQ'D			
	5	8			NUTS	5/8-11UNC-2B HEX HVY	2600-C38 (33)	MD-PS	
↓	6	1			GSKT	1/16 THK COMP ASBESTOS	2600-C39 (15)		
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307 GR B ZINC PLATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2.

MC NO. - PS 166

SERVICE - EXHAUST PIPING CARGO PUMP RM

GROUP NO. 6451-0201-1001 S1

APPLICABLE HULLS	613	614	DWG NO.	SHEET	REV.
	YES	YES	6450-680	5	A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		~~1~~	~~1~~	~~P4AD-4"~~	~~4.50 O.D. x .237 THK STL BLK SCHED 40, ASTM-A53-73 GR B~~	~~PMO 6552-453~~	~~PS~~	
↓		~~2~~	~~1~~	~~P4AE-4"~~				
		~~3~~	~~1~~	~~P4AF-4"~~				
		~~4~~	~~1~~	~~P4AG-4"~~				
		~~5~~	~~1~~	~~P6AZ-2"~~	~~2.375 O.D. x .154 THK STL BLK SCHED 40, ASTM-A53-73 GR B~~			
		~~6~~	~~1~~	~~P6BA-2"~~				
		~~7~~	~~1~~	~~P6BB-2"~~				
		~~8~~	~~1~~	~~P6BC-2"~~				
		9						
		10						
		11						
C		~~12~~	~~5~~	~~40WS1~~	~~4" BACKING RING STL, ASTM-A109 FOR 4.50 O.D. x .237 THK STL PIPE~~	~~(6) 2600-C37~~	~~MD-PS~~	
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

MC NO. RS 149

SERVICE - SLOP TK HTR COIL RETURN ON BHD FR 61

GROUP NO. 6552-0203-1001 P1

APPLICABLE HULLS	613	614	DWG NO.	SHEET	REV.
	YES	YES	6450-680	6	C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
G		~~1~~	~~1~~	~~P4AA-4"~~	~~4.50 O.D. x .237 THK STL BLK SCHED 40, ASTM-A53-73 GR B~~	~~PMO 6552-453~~	PS	
↓		~~2~~	~~1~~	~~P4AB-4"~~				
		~~3~~	~~1~~	~~P4AC-4"~~				
		~~4~~	~~1~~	~~P6AV-2"~~	~~2.375 O.D. x .154 THK STL BLK SCHED 40, ASTM-A53-73 GR B~~			
		~~5~~	~~1~~	~~P6AW-2"~~				
		~~6~~	~~1~~	~~P6AY-2"~~				
		7						
		8						
		9						
		10						
		11						
G		~~12~~	~~2~~	~~40WS1~~	~~4 BACKING RING STL, ASTM-A109 FOR 4.50 O.D. x .237 THK PIPE~~	~~(6) 2600-C37~~	~~MD-PS~~	
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

MC NO. PS 151

SERVICE - SLOP TK HTR COIL RETURN ON LONG BHD FR 58-61

GROUP NO. 6552-0204-1102 P1

APPLICABLE HULLS	613	614	DWG NO.	SHEET	REV.
	YES	YES	6450-680	7	C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
F		1	1	P2BM-5"	5.563 OD x.258THK STL BLK SCHED 40, ASTM-A53-73 GRB	PMO 6451-462	PS	
A		2	1	P2BN-5"				
A		3	3'0	4PS2	.840 OD x.147THK STL BLK XHVY, ASTM-A53-73 GR B	K57-07-102		
A		4	6"	2PS2	.540 OD x.119THK STL BLK XHVY, ASTM-A53-73 GRB	K57-07-100		
		5						
A		6	4	4ES1	1/2 90° ELL FORGED STL SW 3000#	③ 6200-M12	MD-PS	
		7	1	V-1133	1/4 GLOBE STOP FORGED STL 600# ANSI B16.11 ASTM-A105	① 6450-C9		
		8	1	F-3	1/4 FUNNEL	M0216707 SH4 L-5	ST-PS	
A		9	1	50WS1	5" BACKING RING STL, ASTM-A105 FOR 5.563 OD x.258THK PIPE	⑬ 2600-C37	MD-PS	
		10	5	4US1	1/2 UNION FORGED STL COMM'L 3000# WOG SW	② 6950-C11		
		11	1	F-1	RESERVOIR	MO 257338 S-2 L-7	ST-PS	
		12	1	F-2	DIFFERENTIAL PRESSURE CONTROLLER	(1A) 6555-C5	MD-PS	
A		13	1	V-1131	1/4 GLOBE STOP FORGED STL 600# ANSI B16.11 ASTM-A105	① 6450-C9		
A		14	1	V-1132	1/2 GLOBE STOP FORGED STL 600# ANSI B16.11 ASTM-A105	②		
		15	1	V-911	2" LVL CONTROL C.S. 150# ANSI-B16.5 ASTM-A216 GR WCB	PMO 6552-453	PS	PO 6555-C5 ①
		16	1	V-912	3 GATE C.S. 150# ANSI-B16.5 ASTM A216 GR WCB			
		17	1	V-913	3 GATE			
		18	1	V-914	3 GLOBE STOP			

REMARKS –

MC NO. PS-159

SERVICE – RETURN FRM CARGO TK CLN HTR & DR COOLER FWD SIDE 5B

GROUP NO. 6552-0110-1001 PI

APPLICABLE HULLS	613	614	DWG NO.	SHEET	REV.
	YES	YES	6450-680	8	F

GROUP

REV.		LINE NO.	QTY (1 SHIP)	HANGER NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
E		1	6	H-12	1/2" SWING TYPE H-12 DWG 257056	25-47-326	ST-PS	
E		2	1	H-2	3" FIXED TYPE H-2 DWG 257056	25-41-396		
E		3	2	H-12	5" SWING TYPE H-12 DWG 257056	25-47-426		
E		4	2	H-12	3" SWING TYPE H-12 DWG 257056	25-47-396		
		5						
G		6	1	F22	LOCKING DEVICE, ASSEM'B (LOCKED CLOSED) DWG 255407	97-66-983	ST-PS	
H		7	2	32	3/4" FLG, C.STL, SW 300#	25-18-833		
		8	6	F-25	3/4" UNION, C.STL SW, 3000#	PO ㊶ 6951-C3		
		9	1	F-26	3/4" LIQUID LEVEL GAGE, 38" C.TO C.	PO ③ 6552-C5		
J		10	1	F-27	DRAIN FUNNEL	M0283093 SHT.46, L.1		
H		11	1	F-28	3/4" x 3/4" x 1/4" TEE, C.STL. SW, 3000#	25-02-226		
		12	1	F-29	ORIFICE, 3/8" THK, C.STL	M0216670 S14, L1		
		13	1	F-30	3/4" BOSS, C.STL, SW, 3000#	25-02-224		
		14	5	F31	3/4" ELBOW, 90°, C.STL., SW, 3000#	25-60-007		
		15	10'0"	2PS2	.540 O.D. x 0.119THK. PIPE C.STL, X-HVY, ASTM-A53	57-07-100		
		16	100'0"	6PS2	1.050 O.D. x.154THK. PIPE C.STL., X-HVY, ASTM-A53	57-07-103		
		17	5	6VS1	3/4" GLOBE STOP VLV., C.STL, SW, 600#	PO ⑥ 6450-C9		
		18	1	6VS2	1/4" GLOBE STOP VLV., C.STL, SW, 600#	26-09-260		

REMARKS –

SERVICE – RETURN FROM CARGO TK CLN HTR & DR COOLER FWD SIDE FR 58

GROUP NO. 6552-0110-1001

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	
	YES	YES	6450-680	8A	J

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
G	1	8			BOLTS	~~5/8-11UNC-2A-3LG HEX HD HVY~~	~~2600-C38 ㉞~~	~~MD-PS~~	
G	2	8	4021	4	NUTS	~~5/8-11UNC-2B HEX HD~~	~~2600-C38 ㉝~~		
G	3	1			GSKT	~~1/16 THK COMP ASBESTOS~~	~~2600-C39 ⑳~~		
G	4	8			BOLTS	3/4-10UNC-2A, 3 LG HEX HD HVY	6000-C13 [illegible]	ST-PS	
G	5	8	5021	5"	NUTS	3/4-10 UNC-2B HEX HVY	2600-C38 ⑮		
G	6	1			GSKT	1/16 THK COMP ASBESTOS	15-01-280E		
H	7	4			BOLTS	5/8" HVY HEX HD L= 2 3/8"	6000-C7 [illegible]	ST-PS	
H	8	4	21	3/4"	NUTS	5/8 HVY HEX	6000-C12 ⑱		
H	9	2			GSKT	1/16" COMP ASBESTOS 300#	15-01-236		
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307 GR B ZINC PLATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

MC NO. PS 159

SERVICE – RETURN FRM CARGO TK CLN HTR & DR COOLER FWD SIDE 5B

GROUP NO. 6552-0110-1001 PI

APPLICABLE HULLS	613	614	DWG NO.	SHEET	REV.
	YES	YES	6450-680	9	H

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	~~P4AH-4"~~	~~4.50 OD x.237 THK STL BLK SCHED 40, ASTM-A53-73 GRB~~	~~PMO 6552-453~~	PS	
		2	1	~~P6BD-2"~~	~~2.375 OD x.154 THK STL BLK SCHED 40, ASTM-A53-73 GRB~~			
		3	1	~~P3AJ-2"~~	~~2.375 OD x.120THK 90-10 CUNI SEAMLESS ASME SB466~~			
		4	1	~~P3AK-2"~~				
C		5	1	~~P3BG-2"~~	~~2.375 OD x.120THK 90-10 CUNI SEAMLESS ASME SB 466~~			
C		6	1	~~P3BH-2"~~				
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

MC NO. PS 147

SERVICE – SLOP TK HTR COIL RETURN ON BHD FR61 BELOW 15' LEVEL

GROUP NO. 6552-0201-1201 PI

APPLICABLE HULLS	613	614	DWG NO.	SHEET	REV.
	YES	YES	6450-680	10	C

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C	1	8			BOLTS	~~5/8-11UNC-2A 3LG HEX HD HVY~~	~~2600-C38 ㉞~~	MD-PS	
C	2	8	~~4021~~	~~4~~	NUTS	~~5/8-11UNC-2B HEX HD~~	~~2600-C38 ㉝~~		
C	3	1			GSKT	~~1/16 THK COMP ASBESTOS~~	~~2600-C39 ⑳~~		
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307 GRB ZINC PLATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

MC NO. PS 147

SERVICE – SLOP TK HTR COIL RETURN ON BHD FR61 BELOW 15'0 LEVEL

GROUP NO. 6552-0201-1201 PI

APPLICABLE HULLS	613	614	DWG NO.	SHEET	REV.
	YES	YES	6450-680	11	C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1		~~P2T-5"~~	~~5.563 OD x.258THK STL BLK SCHED 40, ASTM A53-73 GRB~~	~~PMO 6450-681~~	PS	
		2		~~P2U-5"~~				
		3		~~P2V-5"~~				
		4		~~P2W-5"~~				
		5	1	~~P3Y-2"~~	~~2.375 OD x.120THK 90-10 CUNI SEAMLESS ASME SB466~~			
		6	1	~~P3Z-2"~~				
		7	1	~~P6AP-2"~~	~~2.375 OD x.154THK STL BLK SCHED 40, ASTM A53-73 GRB~~			
		8	1	~~P6AR-2"~~				
		9	1	~~P6AS-2"~~				
		10	1	~~P6AT-2"~~				
		11						
		12						
C		13	4	~~50WS1~~	~~5 BACKING RING STL, ASTM-A105 FOR 5.563 OD x.258THK PIPE~~	~~⑬ 2600-C37~~	MD-PS	
		14						
		15						
		16						
		17						
		18						

REMARKS –

MC NO. PS 149

SERVICE – SLOP TK STM SUPPLY BHD FR61

GROUP NO. 6450-0203-1001 PI

APPLICABLE HULLS	613	614	DWG NO.	SHEET	REV.
	YES	YES	6450-680	12	C

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C	1	8			BOLTS	~~3/4-10UNC-2A-3LG HEX HD HVY~~	~~2600-C38 [illegible]~~	~~MD-PS~~	
	2	8	~~5021~~	~~5~~	NUTS	~~3/4-10UNC-2B HEX HVY~~	~~2600-C38 [illegible]~~		
	3	1			GSKT	~~1/16 THK COMP ASBESTOS~~	~~2600-C39 ⑱~~		
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307 GRB ZINC PLATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

MC NO. PS 149

SERVICE – SLOP TK STM SUPPLY BHD FR61

GROUP NO. 6450-0203-1001 PI

APPLICABLE HULLS	613	614	DWG NO.	SHEET	REV.
	YES	YES	6450-680	13	C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	~~P2P-5"~~	~~5.563 OD x.258 THK STL BLK SCHED 40, ASTM A53-73 GR B~~	~~6450-681 PMO~~	PS	
		2	1	~~P2R-5"~~				
		3	1	~~P2S-5"~~				
		4	1	~~P6AL-2"~~	~~2.375 OD x.154 THK STL BLK SCHED 40, ASTM A53-73 GR B~~			
		5	1	~~P6AM-2"~~				
		6	1	~~P6AN-2"~~				
		7						
		8						
		9						
		10						
		11						
C		12	2	~~50WS1~~	~~5" BACKING RING STL, ASTM-A105 FOR 5.563 OD x.258THK PIPE~~	⑬ 2600-C37	MD-PS	
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

MC NO. PS 151

SERVICE – SLOP TK STM SUPPLY ON LONG BHD FR 58-61

GROUP NO. 6450-0204-1102 PI

APPLICABLE HULLS	613	614	DWG NO.	SHEET	REV.
	YES	YES	6450-680	14	C

INSTALLATION GROUPS

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	110'0	10PS1	1.315 OD x.133THK STL BLK SCHED 40, ASTM-A53-73 GR B	K57-06-104	PS	
	2	2	1	P1A-3"	3.50 OD x.216THK STL BLK SCHED 40, ASTM-A53-73 GRB	PMO 6450-681		
	3	3	1	P1B-3"				
	4	4	1	P1C-3"				
	5	5	1	P1D-3"				
	6	6	1	P1E-3"				
	7	7	1	P1F-3"				
	8	8	1	P1G-3"				
		9						
		10						
A	11	11	7	10CS1	1" COUPLING S.W., FORGED STL ASTM-A181, ANSI-B16.11 3000#	⑯ 2600-C36	MD-PS	
	12	12	2	10TS1	1 TEE FORGED STL, S.W. ASTM-A181, ANSI-B16.11 3000#	⑫ 6200-M12		
	13	13	3	10ES1	1 90° ELL FORGED STL S.W. ASTM-A181, ANSI-B16.11 3000#	2560-008	ST-PS	
	14	14	3	J-1	2" FLG SLIP ON DRILL FOR 1" PIPE FORGED STL ANSI-B16.5 150# ASTM-A105	㉜ 6450-C2	MD-PS	
A	15	15	5	30WS1	3" BACKING RING STL, ASTM-A105 FOR 3.50 OD x.216THK PIPE	⑤ 2600-C37		
		16						
		17						
H	18	18	1	V-150	3" GLOBE STOP C.S. ANSI-B16.5 150# ASTM A216 GR WCB	① 6450-C49	MD-PS	

REMARKS –

MC NO. PS 166

SERVICE – STM TO SEA CHEST & STRIPPING PUMP FR 58-60

GROUP NO. 6450-0201-1003 S1

APPLICABLE HULLS	613	614	DWG NO.	SHEET	REV.
	YES	YES	6450-680	15	H

6450-680

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8X

FRAME

GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D	1	24'-0	4PS1	.840 O.D. x .109 THK STL, BLK SCH 40, ASTM-A53-73 GRB	57-04-103	ST-PS	
H	2	8'-0	3PS1	.675 O.D. x .091 THK STL, BLK SCH 40, ASTM-A53-73 GRB	57-04-102		
	3						
	4						
H	5	4	3ES1	3/8-90° ELL, STL., SW, SA-234 GRB, 3000#, ANSI-B16.11, ASTM-A234	25-60-005	ST-PS	
D	6	4	3NS1	3/8" NIPPLE, 6" LG., BLK STL, IPS ASTM-A106	25-14-312E		
H	7	~~2~~	~~F-5~~	~~3/8" NIPPLE, 2" CUT IN HALF IPS, BLK STL.~~	~~25-14-302E~~		
H	8	4	4RS3	1/2" x 3/8" IPS INSERT, C. STL., SW 3000#, ANSI-B16.11, ASTM-A234	25-60-361		
H	9	4	4ES1	1/2-90° ELL, STL, SW, SA-234, GRB 3000# ANSI-B16.11, ASTM-A234	25-60-006		
H	10	2	F-5	3/8 TEE, C. STL., SW, 3000# ANSI-B16.11 GRB	25-60-076	ST-PS	
	11						
	12						
G	13	1	V-1493	1/2" GLOBE STOP, C.S., 600# ANSI-B16.34, SW, AIR DIAPH OPER.	P.O. 6555-C15 ②	MD-PS	
G	14	1	V-1520				
H	15	1	V-1489	1/2" GLOBE STOP CHK. VLV., F.S., ASTM-A105, ANSI-A181	P.O. 6555 C6 ②		
	16	1	V-1490				
	17	1	V-1491				
	18	1	V-1492				

REMARKS -

SERVICE - STM TO SEA CHEST & STRIPPING PUMP FR 58-60
GROUP NO. 6450-0201-1003 SI
APPLICABLE HULLS: 613C NO; 614C YES
DWG NO. 6450-680 SHEET 15A REV. H

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY 10 SHIP	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	12			BOLTS	5/8-11UNC-2A-2 1/2 LG HEX-HD HVY	2600-C38 (53)	MD-PS	
	2	12	2021	2	NUTS	5/8-11UNC-2B HEX HVY	2600-C38 (33)		
	3	3			GSKT	1/16 THK COMP ASBESTOS	2600-C39 (21)		
A	4	12			BOLTS	5/8-11UNC-2A-3" LG HEX-HD HVY	2600-C38 (54)		
A	5	12	3021	3	NUTS	5/8-11UNC-2B HEX HVY	2600-C38 (33)		
A	6	3			GSKT	1/16 THK COMP ASBESTOS	2600-C39 (22)		
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307 GRB ZINC PLATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

MC NO. PS 166
SERVICE - STM TO SEA CHEST & STRIPPING PUMP FR 58-60
GROUP NO. 6450-0201-1003 SI
APPLICABLE HULLS: 613 YES; 614 YES
DWG NO. 6450-680 SHEET 16 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	HGR NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
E	1	14	H-12	1" SWING TYPE H-12 W/EXTRA LEG, DWG 257056	25-47-346	ST-PS	
E	2	1	H-3	1" FIXED TYPE H-3 DWG 257056	25-42-346		
E	3	2	H-13	3" SWING TYPE H-13 DWG 257056	25-48-396		
E	4	3	H-12	3" SWING TYPE H-12 DWG 257056	25-47-396		
E	5	2	F-6	SUPPORT LEGS FOR 3" H-13, 3/4" X-HVY PIPE ASTM-A53	25-50-610		
E	6	5	F-7	SUPPORT LEG FOR 3" H-12, 1 1/4 X 1/4 FLAT BAR, ABS GRA	71-30-210	PS	
E	7	1	SH-99	3" SPRING HANGER .2" UP	PO ① 6450-C58	ST-PS	
F	8	2	F-8	SUPPORT LEG FOR 3" H-13 1" X-HVY PIPE 48" LG ASTM-A53	25-50-623	PS	
E	9	2	F-9	BRACE FOR 3" H-13 1/2 X-HVY PIPE 36" LG ASTM-A53	S/Y 57-10-106		
E	10	1	F-10	3X3X3/8 ANGLE BAR 48" LG C.S. ABS GRA OR EQ.	S/Y 73-05-246		
E	11	1	F-11	3X3X3/8 ANGLE BAR 66" LG C.S. ABS GRA OR EQ.	S/Y 73-05-246		
E	12	2	F-12	2X1/4 FLAT BAR 2" LG C.S. ABS GRA OR EQ	71-30-330		
E	13	6	H-12	1/2" SWING TYPE H-12 HGR DWG 257056	25-47-326	ST-PS	
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - STM TO SEACHEST & STRIPPING PUMP FR 58-60
GROUP NO. 6450-0201-1003
APPLICABLE HULLS: 613C YES; 614C YES
DWG NO. 6450-680 SHEET 16A REV. F

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	P5BJ-10"	10.75 OD x .365 THK STL BLK SCHED 40, ASTM-A53-73 GRB	PMO 6450-681	PS	
	2	1	P5BK-10"				
	3	1	P5BL-10"				
	4						
	5						
	6						
A	7	1	100WS1	10" BACKING RING STL, ASTM-A109 FOR 10.75 OD x .365 THK PIPE	(14) 2600-C37	MD-PS	
	8						
	9						
A	10	1	V-4004	10" GATE C.S. FLG ANSI B16.5 150# ASTM-A105	(46) 6451-C3	MD-PS	
	11						
E	12	1	H-13	10" SWING TYPE H-13 DWG NO 257056	25-48-466	ST-PS	
E	13	1	F-16	SUPPORT LEG FOR 10" H-13 2 1/2 X 2 1/2 X 1/4 ANGLE BAR 54" LG. ABS GRA OR EQ.	73-05-194	PS	
E	14		F-17	BRACE FOR 10" H-13 3X3X3/8 ANGLE BAR 8'-6 LG. ABS GR A OR EQ	73-05-246		
E	15		F-18	BRACE FOR 10" H-13 3X3X3/8 ANGLE BAR 66" LG ABS GR A OR EQ	73-05-246		
	16						
	17						
	18						

REMARKS -

MC NO. PS-159
SERVICE - STEAM TO C.O. TK CLN HTR & DR COOLER FWD SIDE BHD 58
GROUP NO. 6450-0110-1004 PI
APPLICABLE HULLS: 613 YES; 614 YES
DWG NO. 6450-680 SHEET 17 REV. E

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY 10 SHIP	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	24			BOLTS	7/8-9UNC-2A-3 3/4 LG HEX HD HVY	2600-C38 (4)	MD-PS	
	2	24	10021	10	NUTS	7/8-9UNC-2B HEX HD	2600-C38 (16)		
	3	2			GSKT	1/16 THK COMP ASBESTOS	2600-C39 (23)		
	4	12			BOLTS	7/8-9UNC-2A-3 3/4 LG HEX HD HVY	2600-C38 (4)		
	5	12	12021	12	NUTS	7/8-9UNC-2B HEX HD	2600-C38 (16)		
	6	1			GSKT	1/16 THK COMP ASBESTOS	2600-C39 (24)		
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307 GRB ZINC PLATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B 18.2.2

MC NO. PS 159
SERVICE - STEAM TO C.O. TK CLN HTR & DR COOLER FWD SIDE BHD 58
GROUP NO. 6450-0110-1004 PI
APPLICABLE HULLS: 613 YES; 614 YES
DWG NO. 6450-680 SHEET 18 REV. A

INSTALLATION - GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C	1	1	1	~~P6AU-2"~~	~~2.375 OD x .154 THK STL BLK SCHED 40 ASTM-A53-73 GRB~~	~~PMO 6450-681~~	PS	
	2	2	1	~~P3BE-2"~~	~~2.375 OD x .120 THK 90/10 CU/NI SEAMLESS ASME SB466~~			
	3	3	1	~~P3BF 2"~~				
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

MC NO. PS 147
SERVICE - SLOP TK STM SUPPLY BHD FR 61 BELOW 15' LVL
GROUP NO. 6450-0201-1005 PI
APPLICABLE HULLS: 613 YES; 614 YES
DWG NO. 6450-680 SHEET 19 REV. C

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C	1	1	P1BP-3	3.5 OD. X .216 THK STL. BLK SCHED. 40, ASTM-A53-73 GR.B	6450-681 PMO	PS	
	2	1	P1BR-3				
	3	1	P1BS-3				
	4	1	P1BU-3				
	5	1	P1BV-3				
	6	1	P1BW-3				
	7	1	P1BY-3				
	8	1	P1BZ-3				
	9	1	P1CA-3				
	10	1	P1CC-3				
	11	1	P1CD-3				
	12	1	P1CE-3				
C	13	12	30WS1	3" BACKING RING STL ASTM-A109 FOR 3.5 OD X .216 THK STL PIPE	97-18-126	ST-PS	
C	14	1	P3BT-1½	1.900 O.D. X .145 THK STL. BLK. SCHED 40, ASTM-A53-73 GRB	6450-681 PMO	PS	
	15	1	P3BX-1½				
	16	1	P3CB-1½				
	17	1	P3CF-1½				
	18						

REMARKS -

SERVICE - SLOP TK. STM SUPPLY ON LONG BHD FR 58-61
GROUP NO. 6450-0204-1102 PI
APPLICABLE HULLS: 613 YES; 614 YES
DWG NO. 6450-680 SHEET 20 REV. C

GROUP

REV.	LINE NO.	QTY (1 SHIP)	HGR NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
E	1	3	H-13	3" SWING HGR TYPE H-13 DWG 257056	25-48-396	ST-PS	
E	2	3	H-13	1 1/2" SWING HGR TYPE H-13 DWG 257056	25-48-366		
E	3	9	H-12	3" SWING HGR TYPE H-12 DWG 257056	25-47-396		
E	4	3	H-12	1 1/2" SWING HGR TYPE H-12 DWG 257056	25-47-366		
E	5	6	H-14	3" SWING HGR TYPE H-14 DWG 257056	25-49-396		
E	6	6	H-2	3" FIXED HGR TYPE H-2 DWG 257056	25-41-396		
E	7	2	H-2	1 1/2 FIXED HGR. TYPE H-2 DWG 257056	25-41-366		
F	8	3	F-15	SUPPORT LEG FOR 1 1/2, H13 1/2" X-HVY PIPE ASTM-A53	25-50-600	PS	
F	9	15	F-6	SUPPORT LEG FOR 3" H-13 & H-14 3/4" X-HVY PIPE ASTM-A53	25-50-606		
	10						
E	11	4	F-19	8 X 2.26 X 11.5# CHANNEL BAR 30" LG. STRUCT STL, ABS REQUIREMENTS GR.A	73-09-144	PS	
E	12	2	F-20	10 X 2.6 X 15.3# CHANNEL BAR 48" LG. STRUCT STL ABS REQUIREMENTS GR A	73-09-168		
E	13	4	F-21	SUPPORT LEG FOR 1 1/2 & 3" H-12, 1 1/4 X 1/4 FLAT BAR 15" LG. STL ABS GR A OR EQ	71-30-210		
G	14	1	F-22	10 x 2.50# CHANNEL, STL ABS REQUIREMENTS, GR A	73-09-168	PS	
G	15	1	F-23	6 x 2.50# CHANNEL, STL ABS REQUIREMENTS, GR A	73-09-128		
	16						
	17						
	18						

REMARKS -

SERVICE - SLOP TK STM SUPPLY ON LONG BHD FR 58-61
GROUP NO. 6450-0204-1102
APPLICABLE HULLS: 613C YES; 614C YES
DWG NO. 6450-680 SHEET 20A REV. G

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C	1	1	P1CG-3	3.5 O.D. X .216 THK. STL. BLK SCHED. 40, ASTM-A53-73 GR.B	6450-681 PMO	PS	
	2	1	P1CH-3				
	3	1	P1CJ-3				
	4	1	P1CL-3				
	5	1	P1CM-3				
	6	1	P1CN-3				
	7	1	P1CR-3				
	8	1	P1CS-3				
	9	1	P1CT-3				
	10	1	P1CV-3				
	11	1	P1CW-3				
	12	1	P1CX-3				
	13	1	P1FT-3				
	14	1	P1FU-3				
	15	1	P1FV-3				
C	16	18	30WS1	3" BACKING RING, STL, ASTM-A109 FOR 3.5 O.D. X .216 THK STL PIPE	97-18-126	ST-PS	
C	17	1	P3CK-1½	1.900 OD. X .145 THK. STL. BLK. SCHED 40, ASTM-A53-73 GR.B	6450-681 PMO	PS	
	18	1	P3CP-1½				

REMARKS -

SERVICE - SLOP TK STM SUPPLY ON BHD FR 61
GROUP NO. 6450-0203-1001 PI
APPLICABLE HULLS: 613 YES; 614 YES
DWG NO. 6450-680 SHEET 21 REV. C

6450-680

MICRO-MASTER® 105 mm

SEPT. '80

FRAME

8X

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
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INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	P3CU-1½	1.900 O.D. X .145 THK STL BLK SCHED 40, ASTM-A53-73 GR.B	6450-681 PMO	PS	
↓		2	1	P3CY-1½	↓	↓	↓	
↓		3	1	P3FW-1½	↓	↓	↓	
		4					↓	
C		5	1	P7CZ-2	2.375 O.D.X.154 THK.STL.BLK. SCHED 40, ASTM-A53-73 GR.B	6450-681 PMO	↓	
↓		6	1	P7DA-2	↓	↓	↓	
↓		7	1	P7DB-2	↓	↓	↓	
		8					↓	
C		9	1	P2DF-2	2.375O.D. X.120 THK. 90:10 CUNI,SEAMLESS,ASME SB466	6450-681 PMO	↓	
↓		10	1	P2DG-2	↓		↓	
↓		11	1	P2DH-2	↓		↓	
↓		12	1	P2DJ-2	↓		↓	
↓		13	1	P2DK-2	↓		↓	
↓		14	1	P2DL-2	↓		↓	
↓		15	1	P2DM-2	↓		↓	
↓		16	1	P2DN-2	↓		↓	
↓		17	1	P2DP-2	↓		↓	
↓		18	1	P2DR-2	↓		↓	

REMARKS –

SERVICE – SLOP TK STM SUPPLY
ON BHD FR 61

GROUP NO.	6450-0203-1001 P1			
APPLICABLE HULLS	613	614		
	YES	YES		
DRG NO.	6450-680	SHEET	22	REV. C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	P2DS-2	2.375 OD. X.120 THK. 90:10 CUNI,SEAMLESS ASME SB466	6450-681 PMO	PS	
↓		2	1	P2DT-2	↓	↓	↓	
		3		HGR NO.				
E		4	28	H-14	3" SWING TYPE H-14 DWG 257056	25-49-396	ST-PS	
E		5	3	H-14	3" SWING TYPE H-14 W/2 EXTRA LEGS DWG 257056	25-49-396	↓	
E		6	11	H-14	1½ SWING TYPE H-14 DWG 257056	25-49-366	↓	
E		7	2	H-14	1½ SWING TYPE H-14 W/2 EXTRA LEGS DWG 257056	25-49-366	↓	
E		8	6	H-14	2" SWING TYPE H-14 DWG 257056	25-49-376	↓	
E		9	2	H-13	1½ SWING TYPE H-13 DWG 257056	25-48-366	↓	
		10	3					
		11	1					
F		12	80	F-6	SUPPORT LEGS FOR 2" & 3" H-14, 3/4" X-HVY PIPE ASTM-A53	25-50-606	PS	
F		13	30	F-15	SUPPORT LEGS FOR 1½" H-14, 1/2" X-HVY PIPE ASTM-A53	25-50-600	↓	
F		14	2	F-15	SUPPORT LEGS FOR 1½" H-13, 1/2" X-HVY PIPE ASTM-A53	25-50-600	↓	
		15						
		16						
E		17	10	H-14	2" SWING TYPE H-14 NO LINER	M.O. 283124 SHT 6G, L1	B10-PS	
E		18	20	H-12	2" SWING TYPE H-12 NO LINER	M.O. 283124 SHT 6F, L5	↓	

REMARKS –

SERVICE – SLOP TK STM SUPPLY ON
BHD FR 61

GROUP NO.	6450-0203-1001 P1			
APPLICABLE HULLS	613	614		
	YES	YES		
DRG NO.	6450-680	SHEET	23	REV. F

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	P3DC-1½	1.900 O.D. X .145 THK. STL. BLK. SCHED 40, ASTM-A53-73 GR.B	6450-681 PMO	PS	
↓		2	1	P3DD-1½	↓	↓	↓	
		3						
C		4	1	P4DE-1½	1.900O.D. X .112 THK. 90:10 CUNI SEAMLESS, ASME SB466	6450-681 PMO	PS	
G		5	1	P4FX-1½	↓	↓	↓	
E		6	2	H-12	1½ SWING TYPE H-12 DWG 257056	25-47-366	ST-PS	
E		7	2	H-14	1½ SWING TYPE H-14 DWG 257056	25-49-366	↓	
F		8	1	H-11	1½ SWING TYPE H-11 NO LINER	MO 283124 SHT 24, L 1	B10-PS	
F		9	4	F-15	SUPPORT LEG FOR 1½", H-14 1/2" X-HVY PIPE ASTM-A53	25-50-600	PS	
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – SLOP TK STM SUPPLY BHD FR61
BELOW 15'-0 LVL.

GROUP NO.	6450-0201-1005 P1.			
APPLICABLE HULLS	613	614		
	YES	YES		
DRG NO.	6450-680	SHEET	24	REV. G

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	P1FA-3	3.5 O.D. X .216 THK. STL. BLK SCHED 40, ASTM-A53-73 GR.B	6552-453 PMO	PS	
↓		2	1	P1FB-3	↓	↓	↓	
↓		3	1	P FC-3	↓	↓	↓	
↓		4	1	P1FE-3	↓	↓	↓	
↓		5	1	P1FF-3	↓	↓	↓	
↓		6	1	P1FG-3	↓	↓	↓	
↓		7	1	P1FJ-3	↓	↓	↓	
↓		8	1	P1FK-3	↓	↓	↓	
↓		9	1	P1FL-3	↓	↓	↓	
↓		10	1	P1FN-3	↓	↓	↓	
↓		11	1	P1FP-3	↓	↓	↓	
↓		12	1	P1FR-3	↓	↓	↓	
C		13	12	30WS1	3" BACKING RING STL, ASTM-A109 FOR 3.5 O.D.X .216 THK STL PIPE	97-18-12.6	ST-PS	
C		14	1	P3FD-1½	1.900 O.D.X.145 THK. STL.BLK. SCHED 40, ASTM-A53-73 GR.B	6552-453 PMO	PS	
↓		15	1	P3FH-1½	↓	↓	↓	
↓		16	1	P3FM-1½	↓	↓	↓	
↓		17	1	P3FS-1½	↓	↓	↓	
		18						

REMARKS –

SERVICE – SLOP.TK HTR COIL RETURN
ON LONG BHD FR58-61

GROUP NO.	6552-0204-1102 P1			
APPLICABLE HULLS	613	614		
	YES	YES		
DRG NO.	6450-680	SHEET	25	REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
E		1	21	H-12	3" SWING TYPE H-12 DWG 257056	25-47-396	ST-PS	
E		2	7	H-12	1½ SWING TYPE H-12 DWG 257056	25-47-366	↓	
E		3	3	H-13	1½ SWING TYPE H-13 DWG 257056	25-48-366	↓	
E		4	6	H-14	3" SWING TYPE H-14 DWG 257056	25-49-396	↓	
E		5	6	H-2	3" FIXED TYPE H-2 DWG 257056	25-41-396	↓	
E		6	2	H-2	1½ FIXED TYPE H-2 DWG 257056	25-41-366	↓	
F		7	2	F-15	SUPPORT LEG FOR 1½" H-13 1/2" X-HVY PIPE ASTM-A53	25-50-600	PS	
F		8	15	F-6	SUPPORT LEG FOR 3", H-13 & H-14 3/4" X-HVY PIPE ASTM-A53	25-50-606	↓	
E		9	4	F-21	EXTRA LEG FOR 1½ & 3" H-12 1¼X¼ FLAT BAR 15" LG STL, ABS GR A	71-30-210	↓	
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – SLOP TK HTR COIL RETURN
ON LONG BHD FR 58-61

GROUP NO.	6552-0204-1102			
APPLICABLE HULLS	613C	614C		
	YES	YES		
DRG NO.	6450-680	SHEET	25A	REV. E

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	P1ED-3	3.5 O.D.X.216 THK.STL. BLK SCHED. 40, ASTM-A53-73 GR.B	6552-453 PMO	PS	
↓		2	1	P1EE-3	↓	↓	↓	
↓		3	1	P1EF-3	↓	↓	↓	
↓		4	1	P1EH-3	↓	↓	↓	
↓		5	1	P1EJ-3	↓	↓	↓	
↓		6	1	P1EK-3	↓	↓	↓	
↓		7	1	P1EM-3	↓	↓	↓	
↓		8	1	P1EN-3	↓	↓	↓	
↓		9	1	P1EP-3	↓	↓	↓	
↓		10	1	P1ES-3	↓	↓	↓	
↓		11	1	P1ET-3	↓	↓	↓	
↓		12	1	P1EU-3	↓	↓	↓	
↓		13	1	P1EW-3	↓	↓	↓	
↓		14	1	P1EX-3	↓	↓	↓	
↓		15	1	P1EY-3	↓	↓	↓	
C		16	15	30WS1	3" BACKING RING, STL. ASTM-A109 FOR 3.5 O.D.X .216 THK STL. PIPE	97-18-126	ST-PS	
G		17	1	~~P3EC-1½~~	~~1.900 O.D.X.145 THK. STL.~~ ~~BLK. SCHED 40 ASTM-A53-73~~ GR.B	~~6552-453~~ ~~PMO~~	PS	
↓		18	1	P3EG-1½	1.900 O.D. × .145 THK STL BLK SCHED 40 ASTM-A53-73 GR B	PMO 6552-453	↓	

REMARKS –

SERVICE – SLOP TK HTR COIL RETURN
ON BHD FR61

GROUP NO.	6552-0203-1001 P1			
APPLICABLE HULLS	613	614		
	YES	YES		
DRG NO.	6450-680	SHEET	26	REV. G

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	P3EL-1½	1.900 O.D. X .145 THK. STL. BLK. SCHED. 40 ASTM-A53-73	6552-453 PMO	PS	
↓		2	1	P3ER-1½	↓	↓	↓	
↓		3	1	P3EV-1½	↓	↓	↓	
↓		4	1	P3EZ-1½	↓	↓	↓	
		5						
E		6	34	H-14	3" SWING TYPE H-14 DWG 257056	25-49-396	ST-PS	
E		7	12	H-14	1½ SWING TYPE H-14 DWG 257056	25-49-366	↓	
E		8	1	H-14	1½ SWING TYPE H-14 W/2 EXTRA LEGS DWG 257056	25-49-366	↓	
		9						
		10						
F		11	24	F-15	SUPPORT LEGS FOR 1½" H-14 1/2" X-HVY PIPE ASTM-A53	25-50-600	PS	
F		12	68	F-6	SUPPORT LEGS FOR 3" H-14 & H-7, 3/4" X-HVY PIPE ASTM-A53	25-50-606	↓	
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – SLOP TK HTR COIL RETURN
ON BHD 61

GROUP NO.	6552-0203-1001			
APPLICABLE HULLS	613	614		
	YES	YES		
DRG NO.	6450-680	SHEET	27	REV. F

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	P4EA-1½	1.900 O.D. X .112 THK. 90:10 CUNI SEAMLESS, ASME SB466	6552-453 PMO	PS	
G		2	1	P4FY-1½	↓	↓	↓	
C		3	1	P3EB-1½	1.900 O.D. X .145 THK. STL BLK. SCHED 40 ASTM-A53-73 GR.B	6552-453 PMO	PS	
G		4	1	P3EC-1½	↓	↓		
E		5	2	H-12	1½ SWING TYPE H-12 DWG 257056	25-47-366	ST-PS	
F		6	1	H-11	1½ SWING TYPE H-11 NO LINER	MO 283124 SHT 24, L1	B10-PS	
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – SLOP TK HTR COIL RETURN ON
BHD FR61 BELOW 15'-0 LEVEL

GROUP NO.	6552-0201-1201 P1			
APPLICABLE HULLS	613	614		
	YES	YES		
DRG NO.	6450-680	SHEET	28	REV. G

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	P6DX-3	3.5 O.D. X .300 THK. STL, BLK X-HVY, ASTM-A53, GR.B TY.S	6552-453 PMO	PS	
↓		2	1	P6DY-3	↓	↓	↓	
↓		3	1	P6DZ-3	↓	↓	↓	
		4						
		5	3	H-12	3" SWING TYPE H-12 W/EXTRA LEG NO LINER	M.O. 283124 SHT 6F, L9	B10-PS	
		6	3	H-13	3" SWING TYPE H-13 W/EXTRA LEG NO LINER	M.O. 283124 SHT 6F, L 13	↓	
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – SLOP TK HTR COIL RETURN ON
LONG. BHD PORT IN CENTER TK NO. 8

GROUP NO.	6552-0202-1201 P1			
APPLICABLE HULLS	613	614		
	YES	YES		
DRG NO.	6450-680	SHEET	29	REV. E

6430-680

MICRO-MASTER® 105 mm
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SEPT. '80

FRAME

8X

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	P6 D0-3	3.5 O.D. X.300 THK STL, BLK X-HVY ASTM, A53, GR. B TYS	6552-453 PMO	PS	
↓		2	1	P6DV-3	↓	↓	↓	
↓		3	1	P6 DW-3	↓	↓	↓	
		4						
C		5	3	30WS2	3" BACKING RING STL ASTM-A109 FOR 3.5 OD. X .300 THK STL PIPE	97-18-104	ST-PS	
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – SLOP TK. HTR. COIL RET. ON LONG. BHD.
PORT BEL 15'-0 LVL. IN CENTER TK. NO. 8

GROUP NO. 6552-0204-1201-P1

APPLICABLE HULLS	613	614								DWG NO.	SHEET	REV.
	YES	YES								6450-680	30	C

6450-680

MICRO-MASTER 105 mm

K+E

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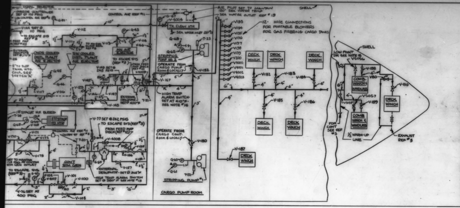
FRAME

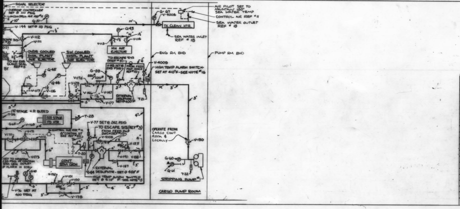
8X


AIR PILOT SET TO MAINTAIN 180° SEA WATER TEMP
SEA WATER OUTLET REF #19
SHELL
G-67
V-4004
TK CLEAN HTR
SEA WATER INLET REF #13
G-63
G-62
T-23
STRIPPING PUMP NO. 2
OPERATE FROM CARGO PUMP ROOM & LOCALLY
V-152
V-167
HIGH TEMP ALARM SWITCH-SET AT 410°F-SEE NOTE #16
OPERATE FROM CARGO CONT. ROOM & LOCALLY
V-150
G-60
G-61
T-22
STRIPPING PUMP #1
CARGO PUMP ROOM
12- HOSE CONNECTIONS FOR PORTABLE BLOWERS FOR GAS FREEING CARGO TANKS
V193
V194
V195
V196
V197
V198
V199
V200
V4000
V4001
V4002
V4003
DECK WINCH
V-182
V-183
V-184
V-185
V-186
V-187
LOW POINT DR SEE NOTE 18
VS056
V-188
V80
COMB. WINCH & WINDLASS
V-190
VS057
V-189
V513P
FOR CONT SEE REF #3
½ WARM-UP LINE
EXHAUST REF #3
1ST STAGE H.P. BLEED
V-77 SET @ 262 PSIG
TO ESCAPE SYS (REF #3)
CONT STM GEN
V-76 SET AT 400 PSIG
V-100
V-103
CNDS COOLED DISTL PLANT
SW COOLED DISTL PLANT AIR EJECTOR
MN AIR EJECTOR
V-144
V-112
G-43
V-114
V-166
EXTERNAL DESUPHTR-SET @ 400°F

Symbol list:

	WHISTLE
	PRESS GAGE (LOCATE AT LOCAL BURNER CONT STA)
	STOP VALVE
	FLOW CONTROL VALVE
	ANGLE STOP CK VALVE
	RELIEF VALVE
	GLOBE STOP CK V. (MOTOR OPER)
	PRESS RED. VALVE
	PRESS GAGE (LOC IN CARGO CONT RM)
	PRESSURE GAGE (LOCAL)
	STRAINER Y-TYPE
	THERMOMETER (LOCAL)
	GATE VALVE
	GATE VALVE (MOTOR OPER)
	PRESS-TEMP CONTROL VALVE
	SOLENOID VALVE
	PRESSURE GAGE (LOC IN EOS)
	THERMOMETER (LOC IN EOS)
SYMBOL LIST	

615C
DIAGRAM
DESUPERHEATED AUXILIARY
STEAM & H.P. TURBINE BLEED


SIGNAL SELECTOR
OVERIDE CONTROLLER
AIR PILOT SET TO MAINTAIN 180° SEA WATER TEMP
CONTROL AIR REF #11
SEA WATER OUTLET REF #18
G-67
V-4004
TK CLEAN HTR
SEA WATER INLET REF #18
V-144 SET @ 110 PSIG
V-112
V-111
G-43
V-116
MN AIR EJECTOR
CNDS COOLED DISTL PLANT AIR EJECTOR
SW COOLED DISTL PLANT AIR EJECTOR
ENG RM BHD
PUMP RM BHD
V-4003
HIGH TEMP ALARM SWITCH-SET AT 410°F-SEE NOTE #16
TO ESCAPE SYS (REF #3)
FROM FEED PMP DISCH (REF #10)
EXTERNAL DESUPHTR-SET @ 400°F
V-157
V-177
T-21
1ST STAGE H.P. BLEED
5TH STAGE FD HTR
V-77 SET @ 262 PSIG
TO ESCAPE SYS (REF #3)
FROM FEED PMP DISCH (REF #10)
V-4006
CONT STM GEN
EXTERNAL DESUPHTR - SET @ 400°F
HIGH TEMP ALARM SWITCH SET @ 410°F SEE NOTE #13
V-76 SET AT 400 PSIG
V-101
V-178
OPERATE FROM CARGO CONT ROOM & LOCALLY
V-150
G-60
G-61
T-22
STRIPPING PUMP #1
CARGO PUMP ROOM

Symbol list:

	PULSATION DAMPENER
	ANGLE STOP VALVE
	WHISTLE
	PRESS GAGE (LOCATE AT LOCAL BURNER CONT STA)
	STOP VALVE
	FLOW CONTROL VALVE
	ANGLE STOP CK VALVE
	RELIEF VALVE
	GLOBE STOP CK V. (MOTOR OPER)
	PRESS RED VALVE
	PRESS GAGE (LOC IN CARGO CONT RM)
	PRESSURE GAGE (LOCAL)
	STRAINER Y-TYPE
	THERMOMETER (LOCAL)
	GATE VALVE
	GATE VALVE (MOTOR OPER)
	PRESS-TEMP CONTROL VALVE
	SOLENOID VALVE
	PRESSURE GAGE (LOC IN EOS)
	THERMOMETER (LOC IN EOS)
SYMBOL LIST	

613C & 614C
DIAGRAM
DESUPERHEATED AUXILIARY
STEAM & H.P. TURBINE BLEED

6450-683

REVISIONS

NN C.O. Nº	REV	ZONE	DESCRIPTION	NNS&DD CO DATE	AUTH	OWNER DATE	APPD
	A	-	INITIAL ISSUE	11/6/4		-	-
—	B	-	BY-PASS OF RED VLV V-146, V-101, V-159, V-123, V-105, V-119 WAS 4", 3", 3", 6", 1½" & 3" RESPECTIVELY. BY-PASS OF PRESS TEMP CONTROL VLV V-141 WAS 5". THE ABOVE ALTERATIONS WERE MADE TO SUIT DESIGN DEVELOPMENTS.				
16 H615C		-	NOTED WHISTLE FOR HULL 615C ONLY				
11 H613C & 614C		-	NOTED Nº 2 STRIP PUMP FOR HULL 615C ONLY				
—		-	DISTL PLANT AIR EJECTORS WERE LABELLED Nº1 & Nº2. CHANGES TO SUIT REF 16.	7/10/5		-	-
H613C & 614C 12	C	-	PLAN COMPLETELY REDRAWN FOR H613C & 614C. SLOP TANK HTG COIL STM AND DK MACHY STEAM DELETED (RELOCATED TO CONTAM STEAM SYSTEM) STEAM TO CONTAMINATED STEAM GENERATOR INCREASED TO SUIT LARGER GENERATOR				
—		-	H615C - SIZE OF STEAM TO DECK MACHINERY CORRECTED TO SUIT VENDORS LATEST INFO. H615C - SIZE OF STEAM TO SLOP TANKS CORRECTED TO SUIT ENGINEERS CALCULATIONS			-	-
—		-	SETTING FOR REDUCING VALVE V146 CHANGED FROM 850/225# TO 850/220# AS A DESIGN DEVELOPMENT. HIGH TEMP ALARM ADDED IN STEAM TO STRIPPING PUMPS & DK MACHY	9/2/5			
—	D	-	REMOTE CONTROLLED VALVES AT STRIPPING PUMP STEAM INLET DELETED SINCE THESE PUMPS ARE LOCALLY CONTROLLED ONLY.				
H613C, H614C 12		-	PIPE TO & FROM V171 WAS 5" FOR H613C & H614C.				
H615C 41		-	HOSE CONNECTIONS FOR PORTABLE BLOWERS ADDED ON DECK STEAM FOR H615C.			-	-
20		-	DELETED AUX AIR EJECTOR & ASSOCIATED PIPING.				
—		-	PIPE TO DISTILLING PLANT AIR EJECTORS WAS 1" SIZE. RBW	10/16/5			
31	E	-	TANK CLEANING HEATER RELOCATED TO PUMP ROOM & ASSOCIATED PIPING ALTERED TO SUIT. RBW	11/20/5		-	-
—	F	-	PIPE RUNS ALTERED TO REFLECT SHIP-BOARD INSTALLATION.				
			ADDED GLAND SEALING ST TO CARGO & BALL PUMP TURB. TO SUIT EQUIP. REQUIREMENT. H.M.E			-	-
H615C 48		-	ADDED THERM T-27, T-28 & T-29 FOR ST 4TH STG FD HTR, 5TH STG FD HTR & AUG ST TO AUX EXH (H613 & H614 ONLY)				
615C 43		-	(H615C) ALTERED HTG COILS IN SLOP TANK.	2/23/7			
—	G	-	ADDED VALVES V-4040 & V-4041 TO SOOT BLOWER STEAM				
		-	ADDED VS056 & VS057 (VS13P) TO WINCH & WINDLASS THE ABV FOR H615C ONLY			-	-
		-	ADD V-4042 & ½" WARM-UP LINE TO AFT DK WINCH EXH LINE - 615C	3/1/7			
—	H	-	ALTERED PRESSURE SETTINGS FOR OVERIDE CONTROLLER & V-144 DOWNSTREAM OF TANK CLEANING HEATER REDUCING STATION	2/15/8		-	-
—	J	-	ALT'D EXTERNAL DESUPHTR & HIGH TEMP ALARM & HIGH TEMP ALARM SWITCH TO SLOP TK HEATING COILS WERE 370° & 380°				
			DELETED ½" SENSING LINE FOR V-159 (H613C & H614C ONLY) & V-101 (H613C & H614C ONLY).				
			ALT STM TO TURBO GENERATOR GLAND SEAL	11/15/8			
			DELETED G57 & G66				
			ADDED STM TO SOOT BLOWER CONNECTIONS ON BOILER UPTAKE VALVES				
	K	-	ADDED PULSATION DAMPENER FOR V146 SENSING LINE	12/4/9			

~~AUTHORITY~~

~~GENERAL NOTES~~

FOR LIST OF MATERIAL SEE
NN DWG Nº 6450-684

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS ZAPATA LTR DTD 6 DEC '74
SHELL LTR DTD 19 DEC '74
ABS NOT REQUIRED
USCG LTR (MMT) 5940 DTD 24 FEB '75

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIVISION
FSCM NO. 43689
MACHINERY DEPT.

SCALE NONE = 1 FT
DRAWN R.W. TAYLOR
CHECKED H.M. EDGE
SECT MGR J.K. Johnson
DATE COMPL. 11-6-74
EXAMINED
AUTHORIZED EBF
DATE 11-15-74
TECH APPROVAL On Cop 11-14-74
CSD APPROVAL EBF FOR J.R. WINSTEAD

DIAGRAM
DESUPERHEATED AUXILIARY
STEAM & H.P. TURBINE BLEED-ARR

USMA DESIGN T11-S-46A
~~USMA DWG NO.~~ ~~HULL NO.~~
DWG NO. 6450-683
REV K
SHEET NO. 1 OF 1

NO.	REFERENCES	DWG NO.

DWG. REV — HULL APPLIC

REV	ALL HULLS ONLY					
A	YES	YES	YES			
B	YES	YES	YES			
C	YES	YES	YES			
D	YES	YES	YES			
E	YES	YES	YES			
F	YES	YES	YES			
G	YES	YES	YES			
H	YES	YES	YES			
J	YES	YES	YES			

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 1-24-9 SIGNED J.K. Johnson

GROUP: MC NO.

6450-683
MICRO-MASTER 105 mm
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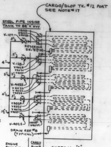
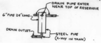
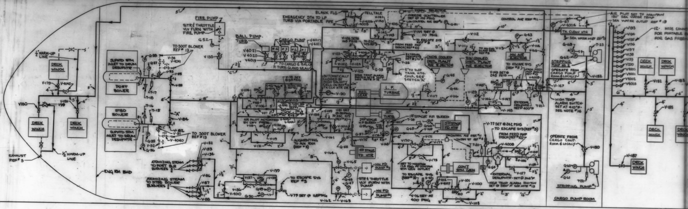
SEPT. '80
10X
FRAME 1

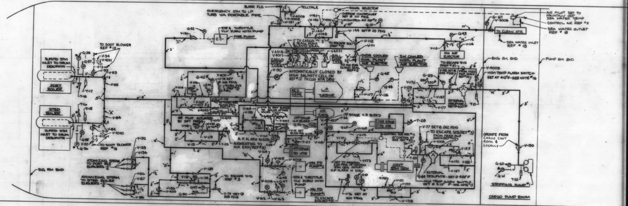

CARGO/SLOP TK. #12 PORT
SEE NOTE #17
STEEL PIPE INSIDE TANK TO BE 'X' HVY
V-127
V4026
V4027
V4020
RESERVOIR SK. 'B' (TYP)
5" STEAM
V-128
V4029
V4030
V4031
V-4025
V4032
V4033
V4034
V4024
V4035
V4036
V4037
V-4025
V4038
V4039
DRAIN REF #8 (TYPICAL)
ENGINE ROOM BHD
CARGO PUMP ROOM

SKETCH "A"


DRAIN PIPE ENTER NEAR TOP OF RESERVOIR
6" PIPE 24" LONG
DRAIN OUTLET
STEEL PIPE (X-HVY IN TANK)

SKETCH "B"


DECK WINCH
DECK WINCH
DECK WINCH
DECK WINCH
½" WARM-UP LINE
EXHAUST REF # 3
ENG RM BHD
SUPHTD STM INLET TO DRUM DESUPHTR
PORT BOILER
STBD BOILER
TO SOOT BLOWER REF # 13
ATOMIZING STEAM TO PORT BLR BURNERS
ATOMIZING STEAM TO STBD BOILER BURNERS
FIRE PUMP
STR & THROTTLE VLV FURN WITH FIRE PUMP
BALL PUMP TURB
CARGO PUMP
BLANK FLG
TELLTALE
EMERGENCY STM TO LP TURB VIA PORTABLE PIPE
SIGNAL SELECTOR
MN AIR EJECTOR
TO ESCAPE SYS
L.P. TURBINE
RED GEAR
H.P. TURB
CONT STM GEN
MN FD PUMP
AUGMENTING TO AUX EXH
AIR PILOT ACTUATED BY DFT PRESS
AUTOMATICALLY CLOSED BY HIGH SALINITY CELL
EXTERNAL DESUPHTR
HIGH TEMP ALARM SWITCH
TK CLEAN HTR
AIR PILOT SET TO MAINTAIN 180° SEA WATER TEMP
SEA WATER OUTLET REF # 13
HOSE CONN FOR PORTABLE FOR GAS FREEING
STRIPPING PUMP NO. 2
OPERATE FROM CARGO PUMP ROOM & LOCALLY
HIGH TEMP ALARM SWITCH SET AT 410°F SEE NOTE #16
OPERATE FROM CARGO CONT. ROOM & LOCALLY
STRIPPING PUMP #1
CARGO PUMP ROOM


BLANK FLG
TELLTALE
SIGNAL SELECTOR
EMERGENCY STM TO LP TURB VIA PORTABLE PIPE
STR & THROTTLE VLV FURN WITH PUMP
FIRE PUMP
TO SOOT BLOWER REF # 13
SUPHTD STM INLET TO DRUM DESUPHTR
PORT BOILER
STBD BOILER
ENG RM BHD
ATOMIZING STEAM TO PORT BLR BURNERS
ATOMIZING STEAM TO STBD BOILER BURNERS
TO SOOT BLOWER REF # 13
CARGO PUMP TURB
AUTOMATICALLY CLOSED BY HIGH SALINITY CELL ON REF # 17, TK CLN HTR DRN
SW COOLED DISTL PLANT AIR EJECTOR
MN AIR EJECTOR
RED GEAR
L.P. TURBINE
H.P. TURB
AIR PILOT ACTUATED BY DFT PRESS
AUGMENTING TO AUX EXH (REF #3)
CONT STM GEN
MN FD PUMP
TO ESCAPE SYS (REF #3)
EXTERNAL DESUPHTR SET @ 400°F
HIGH TEMP ALARM SWITCH SET @ 410°F SEE NOTE # 16
TK CLEAN HTR
AIR PILOT SET TO MAINTAIN 180° SEA WATER TEMP
CONTROL AIR REF # 11
SEA WATER OUTLET REF # 13
SEA WATER INLET REF # 13
ENG RM BHD
PUMP RM BHD
HIGH TEMP ALARM SWITCH SET AT 410°F SEE NOTE #16
OPERATE FROM CARGO CONT ROOM & LOCALLY
STRIPPING PUMP #1
CARGO PUMP ROOM

6450-683

6450 - 683

MICRO-MASTER 105 mm

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SEPT. '80

10X

FRAME 2

REVISIONS

COST CHG NO. NN	COST CHG NO. OWNER	REV	SH NO.	LINE NO.	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
—	—	A	ALL		INITIAL ISSUE.	—	—	—	—
—	—	B	6	-	ADDED VLV SIZE FOR V-95, V-96, & V-97	7/10/5		—	—
			7	-	ADDED VLV SIZE FOR V-100 THRU V-106, V-111, V-118, V-119, & V-120				
			8	-	ADDED VLV SIZE FOR V-121 THRU V-125, V-136 THRU V-138, & V-140 THRU V-143				
			9	-	ADDED VLV SIZE FOR V-145 THRU V-148, V-154 THRU V-156, & V-158 THRU V-161				
			10	-	ADDED VLV SIZE FOR V-170 THRU V-172				
			9 10 4 10 3		300# GATE & GLOBE STOP VALVES ABV 3" WERE BW. VALVE NOS IN NOTE #9 WERE V-177 & V-184. V-168, V-169, V-170, & V-174 WERE GLOBE STOP CHECK. ADDED REF #16. THE ABOVE IS TO SUIT DESIGN DEVELOPMENT.				
H613C & H614C #16	—		6,7 11		NOTED V-75, V-95 THRU V-98 & G-39 FOR H615C ONLY, SET PRESS FOR V-77 WAS 150 FOR H613C & H614C ONLY. JRL				
H613C & H614C #11	—		9 11 12		NOTED V-152, V-153, T-23, G-62, G-63, & SYMBOL "K" IN FLOW DATA TABLE ALTERED FOR H-613C & H614C				
—	—		1		APPROVAL LETTERS ADDED.				
H613C & H614C #12	—	C	8	-	V122 THRU V128 MARKED H615C ONLY.				
			7	-	V102 & V103 MARKED H615C ONLY.				
—	—		8	-	V125 WAS 4", V127 & V128 WAS 8", DESIGN DEV.				
H613C & H614C #12	—		9	-	V145, V148, V152, V153, V154, V156 & V166 MARKED H615C ONLY. SIZE OF V157 WAS 2½" FOR H613C & H614C.				
—	—		9	-	SIZE OF V166 WAS 8". SIZE V150 THRU V153 WAS 4". DESIGN DEV.				
H613C & H614C #12	—		10	-	V167 MARKED H615C ONLY V176, V177 & V178 ADDED FOR H613C & H614C ONLY.				
↓	—		10 A	-	V190, V191 & V192 ADDED FOR H613C & H614C.				
↓	—		4	-	NOTE 13 ALT'D FOR H613C & H614C. NOTE 14 MARKED FOR H615C ONLY. NOTE 16 ADDED JRL				
↓	—		11	-	G-53 MARKED H615C ONLY.				
—	—		11	-	T-26 ADDED FOR H615C ONLY. DESIGN DEVELOPEMENT.				

K&E 19 1253 10-71 2236•

COST CHG NO. NN	COST CHG NO. OWNER	REV	SH NO.	LINE NO.	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	USN DATE	USN APPD
—	—	C	12	-	DATA FOR SYMBOLS G, I, J, K & M ALTERED TO SUIT VENDOR'S INFO AND ENGINEERING CALCULATIONS.	8/20/5	HVS 9-5-75	—	—
—	—		13	-	DESIGN CHARACTERISTICS CORRECTED				
—	—		6	-	V80 ADDED FOR H615C-DESIGN DEV.				
—	—		7	-	V99 ADDED FOR H615C-DESIGN DEV.				
—	—		9	—	ANSI CLASS FOR V149 THRU V-153 & V166 WAS 300#. V149 WAS SET AT 250 PSIG. DESIGN DEVELOPMENT				
12-H613C & H614C	—		9	—	V155 WAS 850/125# FOR H613C & H614C				
↓	—		10	-	V173 WAS 3" FOR H613C & H614C				
—	—		10	—	ANSI CLASS FOR V167 & V179 THRU V189 WAS 300#. DESIGN DEVELOPMENT JRL				
615C #16	—	D	6	-	V75, V95, V96 & V97 DELETED	10/16/5			
↓	—		7	-	V 98 DELETED				
—	—		9	-	V151 & V153 DELETED (PUMPS ARE LOCALLY CONTROLLED ONLY)				
615C #16	—		11	-	G39 DELETED				
#20	—		7	-	V108, V109 & V110 DELETED.				
—	—		7	-	V116 & V117 WERE 1" SIZE				
613C 614C #12	—		10	-	V170, V171 & V172 WAS 4" FOR ALL SHIPS				
20	—		11	-	G54 DELETED.				
20	—		12	-	SYM "O" DELETED.				
-	—		12	-	SYM "R" WAS 1"				
16	—		13	-	REFERENCE TO WHISTLE DELETED.				
615C 41	—		10A	-	V193 THRU V200 & V4000, V4001, V4002 & V4003 ADDED FOR H615C. RBW				
31	—	E	3		ADDED REFS 17, 18 & 19.	11/20/5			
	—		6		ADDED MOTOR OPER TO V-90				
	—		8		V141 WAS 2"				
	—		10A		ADDED V-4004				
	—		11		ADDED G-67. RBW				
—	—	F	5	-	BOLTING FOR ST 220# & BEL. WAS STUDS ALLOY STL	2/23/7		—	—
—	—		6 7 9	—	ADDED SIZES FOR V-78, V-79, V-81, V-101, V-146 & V-155; V158 WAS GLOBE				
—	—		10A 10B	—	ADDED V-4005-4022				
613C-41	—		11	—	ADDED T-27, T-28, & T-29				
—	—		3	-	ADDED REF 20.				
H615 43			10C 10B	-	ADDED V4023 THRU V4039				
↓			4	-	NOTE 17 ALTD				
		G	9		ALTERED V-149 FOR 613C, 614C & 615C. CONTD ON SH-2A WDB				

DIAGRAM OF DESUPHTD AUX STEAM H.P. TURB BLEED - LIST	HULL NO. 613C, 614C, 615C	DWG. NO. 6450-684	REV. G SHEET 2

MN11-11 X 17 (REV. 1)

6450-684

MICRO-MASTER® 105 mm

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SEPT. '80

4X

REVISIONS

COST CHG NO. NN	COST CHG NO. OWNER	REV	SH NO.	LINE NO.	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
—	—	G	10C	-	ADDED VLV V-4040 & V-4041.			—	—
		G	10C 6 4		ADDED VLV V-5056 & V5057 (H615C) ADDED V513P (H615C) ADDED NOTE 18 (H615C).	11/7/7	AC JKY		
			10C	-	ADDED V-4042 FOR H615C				
–	–	H	11 9 12 13	- 1 - -	DELETED T-19. ALTERED PRESSURE SETTING V-144. ALTERED FLOW & VELOCITY INFO FOR SYM L. ADDED NEW DESIGN INFO FOR TANK CLEANING HEATER ERS	2/15/8	AC JKY	–	–
		J	4 12	-	ALT'D NOTE 14 HEATING COIL TEMP WAS 425° F ALT'D SYM M FLOW & VEL WERE 2000 & 176 RESP				
			10B		MADE V-4012 APPLICABLE TO H615C ONLY & MADE V-4007 APPLICABLE TO H615C ONLY				
			6	-	ALT'D SERVICE OF V-89.				
			10C	-	ADDED V4043, V4044 & V4045.				
			4	-	ADDED NOTE NO. 19				
			11	-	ADDED RANGE °F TO INSTRUMENT LIST FOR T-27, T-28 & T-29. DELETED G-57 & G-66	10/5/8	AC JKY	—	—
			10C	-	ADDED V-4046 & V-4047 ERS				

DIAGRAM OF DESUPHTD AUX ST. H.P. TURB BLEED-LIST	HULL NO. 613C, 614C, 615C	DWG. NO. 6450-684	REV. J
			SHEET 2A

NN11-11 X 17 (REV. 1)

K&E 19 1253 3-75 3033A+

6450-684

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REFERENCES

NO.	TITLE	DWG NO.
1	GUIDANCE PLAN DIAGRAM OF DESUPHTD AUX STEAM & H.P. TURB BLEED	216554
2	DIAG MN ST SYSTEM – ARR	6440-505
3	DIAG AUX EXH, BLEED ST & RELIEF VLV ESCAPE – ARR	6451-471
4	DIAG CONTAM ST GEN SYS – ARR	6450-692
5	TYP ARR OF GAGE PIPING	6750-481
6	DIRECTIONS FOR INSULATING & LAGGING OF PIPES & AUX IN E.R.	257322
7	PP ARR - MISC INSTRUMENTS IN ENG RM	6755-67r
8	DIAG DRAIN COLL SYS – ARR	6555-464
9	DIAG GL SEAL, LEAK-OFF TURBINE DR PIPING – ARR	6450-698
10	DIAG BOILER FEED WATER SYS – ARR	6552-372
11	DIAG COMP AIR SYS – ARR	6454-535
12	DIAG MN & AUX SEA WATER CIRC SYS – ARR	6550-359
13	SOOT BLOWERS – ARR	6450-706
14	HTG COILS IN TANKS-ARR	6951-122
15	FABRICATION & WELDING INSTRUCTION FOR CLASS 1 & II PIPING SYS	257035
16	DIAGRAM-DISTILLING PLANT SYSTEM-ARRANGEMENT	6557-88
17	DIAGRAM CNDS, RESERVE & MAKE UP FEED SYS-ARR	6552-380
18	DIAGRAM CARGO OIL & SEG. BALLAST SYS-ARR 613C & 614C	2600-101
19	DIAGRAM CARGO OIL & SEG. BALLAST SYS-ARR H 615C ONLY	2600-103
Ⓕ 20	DIAG CONTAMINATED STEAM GENERATING SYS-ARR	6450-692

DIAGRAM OF DESUPHTD AUX STEAM H.P. TURB BLEED – LIST	HULL NO. 613C, 614C, 615C	DWG. NO. 6450-684	REV. F
			SHEET 3

K&E 19 1253 10-71 2236

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GENERAL NOTES

1. ALL PIPE SIZES SPECIFIED ARE NOMINAL I.P.S. OUTSIDE DIAMETER.
2. MANUFACTURING PROCEDURES AND MATERIAL CERTIFICATION FOR PIPES, VALVES AND FITTINGS ARE TO BE IN ACCORDANCE WITH U.S. COAST GUARD AND AMERICAN BUREAU OF SHIPPING RULES.
3. THE THICKNESS SHOWN IN THE "CALCULATED MIN. THK." COLUMN OF THE PIPE LIST IS THE MINIMUM THICKNESS ALLOWABLE AFTER ALL PIPE END PREPARATION IS COMPLETED AND IS IN ACCORDANCE WITH U.S. COAST GUARD MINIMUM THICKNESS REQUIREMENTS.
4. PIPES MAY BE BENT TO A MINIMUM RADIUS OF 5 I.P.S. DIAMETERS.
5. VALVES MARKED THUS ON THE FACE OF THE PLAN SHALL BE INSTALLED AS FOLLOWS:

FLUID ON THIS SIDE IS ISOLATED FROM STEM PACKING WITH VALVE CLOSED.		FLUID ON THIS SIDE IS IN CONTACT WITH STEM PACKING WITH VALVE CLOSED.

6. LETTERS "A," "B," AND ETC. SHOWN ON PIPE RUNS ARE FOR USE WITH FLOW TABLE ON SHEET 12.
7. GAGE PIPING SHALL BE IN ACCORDANCE WITH REFERENCE #5.
8. INSULATION AND LAGGING REQUIREMENTS SHALL BE IN ACCORDANCE WITH REFERENCE #6.
9. THE BLEED STEAM STOP CHECK VALVES, V168 AND V174, ARE TO BE OF THE PISTON NON-SHOCK TYPE.
10. ALL MOTOR OPERATED VALVES SHALL HAVE HANDWHEELS FOR LOCAL MANUAL CONTROL.
11. MOTOR OPERATED MAIN FEED PUMP AND FIRE AND TANK CLEANING PUMP STEAM SUPPLY VALVES SHALL OPERATE AUTOMATICALLY UPON ACTUATION OF THE ASSOCIATED PUMP REMOTE START-UP PUSH BUTTON AND SHALL HAVE POSITION INDICATOR LIGHTS ON THE MAIN CONSOLE.
12. THE MOTOR OPERATED H.P. TURBINE BLEED VALVES SHALL BE OPERATED BY THE THROTTLE CONTROL SYSTEM (SEE REFERENCE #7) AND SHALL ALSO HAVE OPEN-CLOSE PUSH BUTTONS AND POSITION INDICATOR LIGHTS ON THE MAIN CONSOLE.
13. AN ALARM SHALL BE ACTUATED IN THE ENCLOSED OPERATING STATION WHEN STEAM TEMPERATURE DOWNSTREAM OF THE DESUPERHEATER IN THE EMERGENCY SUPPLY TO THE CONTAMINATED STEAM SYSTEM REACHES 380°F FOR H 615C AND 410° FOR H 613C & H 614C.

⊗14. AN ALARM SHALL BE ACTUATED IN THE ENCLOSED OPERATING STATION WHEN STEAM TEMPERATURE DOWNSTREAM OF THE DESUPERHEATER IN THE STEAM SUPPLY TO THE SLOP TANK HEATING COILS REACHES 380°F.

15. WHERE STELLITE IS SPECIFIED, OTHER SUITABLE ALLOYS OR PROCESSES MAY BE USED.
16. AN ALARM SHALL BE ACTUATED IN THE ENCLOSED OPERATING STATION WHEN STEAM TEMP DOWNSTREAM OF THE DESUPHTR IN THE SUPPLY TO DECK MACHINERY OR STRIPPING PUMPS REACHES 410°F.

⊗17. CARGO/ SLOP TANK №12 IS TO BE FIT WITH FOUR SETS OF HEATING COILS, EACH CONSISTING OF THREE COILS OF 575 FEET EACH OF 2" CU-NI PIPE. THESE 2" COILS ARE TO BE FITTED ALONG SIDES OF TANK. ONE SET OF 1½" CU-NI COILS (CONSISTING OF TWO 425 FT COILS) IS TO BE FIT IN THE BOTTOM OF THE TANK.

⊗18 DECK STEAM MAINS SHALL BE FITTED WITH ¾" LOWPOINT DRAINS VLVS TO ALLOW COMPLETE DRAINAGE OF THOSE PORTIONS OF THE SYSTEM SUBJECT TO FREEZING.

19. SOLENOID VALVE (V-4043) TO OPEN WITH TURBO GENERATOR START UP.

⊗ H 615C ONLY

HULL NO. 613C, 614C, 615C	DWG NO. 6450-684	REV. J
		SHEET 4

K&E 191253 5-74 W 2847A•

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MATERIAL SCHEDULE

SERVICE	ITEM	TYPE	SIZE	MATERIAL	APPLICABLE DOCUMENTS
BOILER PRESSURE DESUPHTD STEAM	PIPING	SEAMLESS	ALL	CARBON STEEL	ASTM A53-73, GR - "B"
	FITTINGS	FLANGED	2-1/2" & ABV	CAST CARBON STEEL	ANSI B16,5-73 600#, ASTM A216-70, GR WCB
		BUTT WELDING		FORGED CARBON STEEL	ANSI B16.9-71 SCH 80, ASTM A234-71
		SOCKET WELDING	2" & BEL		ANSI B16.11-73 3000#, ASTM A234-71
	JOINTS	FLANGED WELD NECK	2-1/2" & ABV	FORGED CARBON STEEL	ANSI B16.5-73 600#, ASTM A105-71
		FLANGED SOCKET WELD	2" & BEL		
	GASKETS	SPIRAL WOUND	ALL	METALLIC ASBESTOS STAINLESS STEEL	600# FLEXITALLIC STYLE CG OR EQUAL
	FLANGE BOLTING	BOLT STUDS		ALLOY STEEL	ASTM A193-74, GR 7 OR EQUAL
		NUTS HVY HEX		STEEL	ASTM A194-73, GR 4 OR EQUAL
H.P. BLEED, AND 220 PSIG REDUCED PRESSURE AUX STEAM	PIPING	SEAMLESS	ALL	CARBON STEEL	ASTM A53-73, GR - "B"
	FITTINGS	FLANGED	2-1/2" & ABV	CAST CARBON STEEL	ANSI B16.5-73 300#, ASTM A216-70, GR WCB
		WELDED BRANCH		CARBON STEEL	ASTM A53-73, GR - "B" AS DELINEATED BY REF. 15
		BUTT WELDING		FORGED CARBON STEEL	ANSI B16.9-71 SCH 40, ASTM A 234-71
		SOCKET WELDING	2" & BEL		ANSI B16.11-73 3000#, ASTM A234-71
	JOINTS	FLANGED SLIP-ON OR FLANGED WELD NECK	2-1/2" & ABV	FORGED CARBON STEEL	ANSI B16.5-73 300#, ASTM A105-71
		FLANGED SOCKET WELD	2" & BEL		
	GASKETS	SHEET	ALL	COMP ASBESTOS	COMMERCIAL 1/16" THK
HP BLEED STEAM	FLANGE BOLTING	BOLT STUDS		ALLOY STEEL	ASTM A193-74, GR 7 OR EQUAL
		NUTS HVY HEX		STEEL	ASTM A194-73, GR 4 OR EQUAL
150 PSIG AND BELOW REDUCED PRESS AUX STEAM	PIPING	SEAMLESS	ALL	CARBON STEEL	ASTM A53-73, GR - "B"
	FITTINGS	FLANGED	2-1/2" & ABV	CAST CARBON STEEL	ANSI B16.5-73 150#, ASTM A216-70, GR WCB
		WELDED BRANCH		CARBON STEEL	ASTM A53-73, GR B AS DELINEATED BY REF. 15
		BUTT WELDING		FORGED CARBON STEEL	ANSI B16.9-71 SCH 40, ASTM A234-71
		SOCKET WELDING	2" & BEL		ANSI B16.11-73 3000#, ASTM A234-71
		FLANGED		CAST CARBON STEEL	ANSI B16.5-73 150#, ASTM A216-70, GR WCB
	JOINTS	FLANGED SLIP-ON	2-1/2" & ABV	FORGED CARBON STEEL	ANSI B16.5-73 150#, ASTM A105-71
		FLANGED SOCKET WELD	2" & BEL		
		UNIONS SOCKET WELD			COMMERCIAL
	GASKETS	SHEET	ALL	COMP ASBESTOS	COMMERCIAL 1/16" THK
220 PSIG & BELOW RED. PRESS AUX STM.	FLANGE BOLTING	BOLTS HVY HEX	ALL	STEEL	ANSI B1.1-60 (THREADS) ANSI B18.2.2 & B18.2.1-72 (HEX HD)
		NUTS HVY HEX			ASTM A194-73, GR 4 OR EQUAL

REMARKS

PIPE LIST

SERVICE	NOM SIZE	CAL MIN THK*	ORDERED THK	SCHEDULE
BOILER PRESSURE DESUPHTD STEAM	6"	.254"	.432" NOM	X-HEAVY
	5"	.213"	.375" NOM	↓
	4"	.173"	.337" NOM	↓
	3"	.199"	.300" NOM	↓
	2-1/2"	.175"	.276" NOM	↓
	2"	.156"	.218" NOM	↓
	1-1/2"	.138"	.200" NOM	↓
	1"	.115"	.179" NOM	↓
	1/2"	.097"	.147" NOM	↓
FIRST STAGE H.P. BLEED	5"	.133"	.258" NOM	STD
	4"	.108"	.237" NOM	STD
	1/2"	.085"	.147" NOM	X-HEAVY
SECOND STAGE H.P. BLEED	5"	.053"	.258" NOM	STD
	1/2"	.073"	.147" NOM	X-HEAVY
220 PSIG REDUCED PRESSURE STEAM	8"	.089"	.322" NOM	STD
	6"	.068"	.280" NOM	↓
	5"	.057"	.258" NOM	↓
	4"	.046"	.237" NOM	↓
	1/2"	.074"	.147" NOM	X-HEAVY
150 PSIG & BELOW REDUCED PRESS. AUX STEAM	10"	.075"	.365" NOM	STD
	10" **	.075"	.500" NOM	X-HEAVY
	8"	.060"	.322" NOM	STD
	8" **	.060"	.500" NOM	X-HEAVY
	6"	.046"	.280" NOM	STD
	4"	.031"	.237" NOM	↓
	3"	.089"	.216" NOM	↓
	2-1/2"	.085"	.203" NOM	↓
	2"	.082"	.154" NOM	↓
	1-1/2"	.078"	.145" NOM	↓
	1"	.074"	.133" NOM	↓
	1/2"	.071"	.147" NOM	X-HEAVY

**PIPE FOR DECK STEAM PIPING TO BE X-HEAVY

*SEE NOTE 3

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
D	~~V-75~~ ⊗	~~1~~	~~later~~	~~ANGLE RELIEF~~	~~CARBON STEEL~~	~~B16.5 150#~~	~~FLG ANSI B16.5~~	~~SST~~	~~AUX ST TO WHISTLE RELIEF VALVE~~	~~SET AT 168 PSIG~~	~~ASTM A-216 GR WCB~~
	V-76 ⊗ △	1	2½x4 4"x6"			B16.5 300#		*	AUX ST TO CONTAM ST GEN & 5TH STAGE FD HTR RELIEF	SET AT 400 PSIG	
	V-77 ⊗ △	1	3"x4 6"x8"			B16.5 150#		SST	AUX ST AUG TO CONTAM ST SYS RELIEF	SET AT 242 PSIG △ SET AT 150 PSIG ⊗	
F	V-78	1	2"x3"						AUX ST TO AIR EJECTORS RELIEF	SET AT 168 PSIG	
F	V-79	1	1¼"x2"						BLR ATOM ST RELIEF	SET AT 168 PSIG	
	~~V-80~~ ⊗ V-513P ⊗	1	½"	GLOBE STOP		B16.3 600#	SW ANSI B16.11		DECK MACHY PIPE WARM-UP		ASTM-A105
F	V-81	1	2½"x 4"	ANGLE RELIEF		B16.5 300#	FLG ANSI B16.5	*	AUX ST TO 4TH STAGE FD HTR RELIEF	SET AT 230 PSIG	ASTM-A216 GR WCB
	V-82	1	5"	ANGLE STOP CHECK		B16.34 600#	BW ANSI B16.25	*	AUX ST STBD BLR DESUPHTR OUTLET		
	V-83	1	5"						PORT		
	V-84	1	5"	GATE					STBD		
	V-85	1	5"						PORT		
	V-86	1	1"	GLOBE STOP	CARBON STEEL		SW ANSI B16.11	SST	STBD BLR BURNER ATMOS ST CO NO. 1		ASTM A105
	V-87	1	1"						NO. 2		
	V-88	1	1"						NO. 3		
J	V-89	1	1"						AUX ST TO TURBO-GEN GLAND SEAL SOLENOID INLET		
E	V-90	1	5"	GATE	CARBON STEEL		BW ANSI B16.25	*	AUX ST TO TK CLEAN HTR CO	MOTOR OPERATED SEE NOTE #10	ASTM A-216 GR WCB
	V-91	1	2"	GLOBE STOP			SW ANSI B16.11		AUX ST TO STBD BLR SOOT BLOWER		ASTM A105
	V-92	1	1½"	CONTROL			FLG ANSI B16.5			FURN WITH BLR	
	V-93	1	2"	GLOBE STOP			SW ANSI B16.11		PORT		
	V-94	1	1½"	CONTROL			FLG ANSI B16.5			FURN WITH BLR	
D	~~V-95~~ ⊗	~~1~~	~~1"~~	~~GLOBE STOP~~					~~WHISTLE PRESS RED VLV INLET~~		
D	~~V-96~~ ⊗	~~1~~	~~1"~~	~~PRESS REDUCING~~	~~CARBON STEEL~~	~~B16.5 600#~~	~~FLG ANSI B16.5~~			~~850/150 PSIG~~	~~ASTM A-216 GR WCB~~
D	~~V-97~~ ⊗	~~1~~	~~1"~~	~~GATE~~	~~CARBON STEEL~~	~~B16.34 600#~~	~~SW ANSI B16.11~~		~~OUTLET~~		

*STAINLESS STEEL AISI 410 OR AISI 416 WITH STEEL STELLITE FACED DISC & SEATS, SEE NOTE 15.

⊗ H615C ONLY △ H613C & H614C ONLY

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-684
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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
D	~~V-98~~ ⊛	~~1~~	~~1"~~	~~GLOBE STOP~~	CARBON STEEL	~~B16.34 600#~~	~~SW ANSI B16.11~~	~~*~~	~~AUX ST TO WHISTLE PRESS RED VLV BYPASS~~		ASTM A-105
	V-99 ⊛	1	½"	GLOBE STOP	CARBON STEEL	B16.34 600#	SW ANSI B16.11	SST	DECK MACHY PIPE WARM-UP		ASTM A-105
	V-100	1	3"	GLOBE STOP	CARBON STEEL	B16.34 600#	BW ANSI B16.25	*	AUX ST TO CONTAM ST GEN & 5TH STG HEATER RED. VLV INLET		ASTM A-216 GR WCB
F	V-101	1	3" △ 1½" ⊛	PRESS REDUCING		B16.5 600#	FLG ANSI B16.5			850/310 PSIG	
C	V-102 ⊛	1	2"	GATE		B16.34 600#	SW ANSI B16.11		OUTLET		
C	V-103 ⊛	1	2"	GLOBE STOP	↓		↓		↓ ↓ ↓ ↓ BYPASS		↓
	V-104	1	1½"	↓ ↓	CARBON STEEL	↓	SW ANSI B16.11		AUX ST TO AIR EJECTOR PRESS RED. VLV INLET		ASTM A-105
	V-105	1	1"	PRESS REDUCING	CARBON STEEL	B16.5 600#	FLG ANSI B16.5			850/150 PSIG	ASTM A-216 GR WCB
	V-106	1	1½"	GATE	CARBON STEEL	B16.34 600#	SW ANSI B16.11		OUTLET		ASTM A105
	V-107	1	1-1/2"	GLOBE STOP				↓	BYPASS		
D	~~V-108~~	~~1~~	~~1-1/2"~~					~~SST~~	~~AUX ST TO AUX AIR EJECTOR ROOT VLV~~		
D	~~V-109~~	~~1~~	~~1-1/2"~~								
D	~~V-110~~	~~1~~	~~1-1/2"~~	↓ ↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ ↓		↓
	V-111	1	2½"	GLOBE STOP	CARBON STEEL	150#	FLG'D	SST	AUX ST TO MN ENG GLAND SEAL		ASTM A-105
	V-112	1	1-1/2"	GLOBE STOP	CARBON STEEL	B16.34 600#	SW ANSI B16.11	SST	AUX ST TO MN AIR EJECTOR ROOT VLV		ASTM A-105
	V-113	1	1-1/2"								
	V-114	1	1-1/2"						↓ ↓ ↓		
	V-115	1	1-1/2"						DSTL PLANT AIR EJECTORS ROOT VLV		
D	V-116	1	1½"						DSTL PLANT #1 AIR EJECTOR		
D	V-117	1	1½"		↓		↓	↓	↓ ↓ ↓ #2 ↓ ↓		↓
	V-118	1	3"	↓ ↓	CARBON STEEL	↓	BW ANSI B16.25	*	AUG TO AUX EXH PRESS RED VLV INLET		ASTM A-216 GR WCB
	V-119	1	2"	PRESS REDUCING		B16.5 600#	FLG ANSI B16.5			AIR PILOT OPER SET AT 57# DECREASING	
	V-120	1	3"	GATE	↓	B16.34 600#	BW ANSI B16.25	↓	↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ OUTLET		↓

*STAINLESS STEEL AISI 410 OR AISI 416 WITH STEEL STELLITE FACED DISC & SEATS, SEE NOTE 15.

⊛ H 615C ONLY
△ H613C & H614C ONLY

HULL NO. 613C, 614C, 615C	**DWG. NO.** 6450-684		
	REV. F	**SHEET** 7 **OF**	

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V-121	1	2"	GLOBE STOP	CARBON STEEL	B16.34 600#	SW ANSI B16.11	*	AUX ST AUG TO AUX EXH PRESS. RED. VLV BYPASS		ASTM A-105
C	V-122 ⊗	1	3"	↓ ↓	CARBON STEEL	↓	BW ANSI B16.25	↓	↓ ↓ TO SLOP TK HTG COIL PRESS. RED. VLV INLET		ASTM A-216 GR WCB
C	V-123 ⊗	1	3"	PRESS. REDUCING	↓	B16.5 600#	FLG ANSI B16.5	↓	↓	850/150 PSIG	ASTM A-216 GR WCB
C	V-124 ⊗	1	3"	GATE	↓	B16.34 600#	BW ANSI B16.25	↓	↓ OUTLET		↓
C	V-125 ⊗	1	2½"	GLOBE STOP	↓	↓	↓	↓	↓ BYPASS		↓
C	V-126 ⊗	1	2½x4"	ANGLE RELIEF	CARBON STEEL	B16.5 150#	FLG ANSI B16.5	SST	↓ RELIEF ↓	SET AT 168 PSIG	↓
C	V-127 ⊗	1	3"	GLOBE STOP	↓	↓	↓	↓	AUX ST TO STBD SLOP TK HTG COILS		↓
C	V-128 ⊗	1	3"	↓ ↓	↓	↓	↓	↓	↓ PORT ↓		↓
	V-129	1	2-1/2"	GATE	↓	B16.34 600#	BW ANSI B16.25	↓	↓ FIRE ~~& TANK CLEANING~~ PUMP ROOT VLV	MOTOR OPERATED NOTE #11 & #10	↓
	V-130	1	2-1/2"	GLOBE STOP	↓	↓	↓	↓	↓		↓
	V-131	1	5"	↓ ↓	CARBON STEEL	↓	↓	*	EMERGENCY STM TO L.P. TURB		ASTM A-216 GR WCB
	V-132	1	1"	↓ ↓	CARBON STEEL	B16.34 600#	SW ANSI B16.11	SST	PORT BLR BURNER ATMOS ST CO NO. 1		ASTM A-105
	V-133	1	1"	↓ ↓	↓	↓	↓	↓	↓ NO. 2		↓
	V-134	1	1"	↓ ↓	↓	↓	↓	↓	↓ NO. 3		↓
	V-135 ◬	1	4"	GLOBE STOP	CARBON STEEL	B16.34 600	BW ANSI B16.25	*	AUX STM TO CONTAM STM PRESS RED. V. INLET		ASTM A-216 GR WCB
	V-136	1	1"	GLOBE STOP	CARBON STEEL	B16.34 600#	SW ANSI B16.11	*	AUX ST TO BLR ATOM ST PRESS. RED. VLV INLET		ASTM A-105
	V-137	1	1"	PRESS. REDUCING	↓	B16.5 600#	FLG ANSI B16.5	↓	↓	850/150 PSIG	↓
	V-138	1	1"	GATE	↓	B16.34 600#	SW ANSI B16.11	↓	↓ OUTLET		↓
	V-139	1	1"	GLOBE STOP	↓	↓	↓	↓	↓ BYPASS		↓
	V-140	1	3"	↓ ↓	CARBON STEEL	↓	BW ANSI B16.25	↓	AUX ST TO TK CLEAN HTR CONTROL VLV INLET		ASTM A-216 GR WCB
E	V-141	1	3"	PRESS./TEMP CONTROL	↓	B16.5 600#	FLG ANSI B16.5	↓	↓		↓
	V-142	1	3"	GATE	↓	B16.34 600#	BW ANSI B16.25	↓	↓ OUTLET		↓
E	V-143	1	3"	GLOBE STOP	↓	↓	↓	↓	↓ BYPASS		↓

*STAINLESS STEEL AISI 410 OR AISI 416 WITH STEEL STELLITE FACED DISC & SEATS, SEE NOTE 15.

◬ H613C & H614C ONLY

⊗ H615C ONLY

HULL NO. 613C, 614C, 615C	DWG. NO.	6450-684	
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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
H	V-144	1	6"X10	ANGLE RELIEF	CARBON STEEL	B16.5 150#	FLG ANSI B16.5	*	AUX ST TO TK CLEAN HTR RELIEF	SET AT 110 PSIG	ASTM A-216 GR WCB
C	V-145 ⊗	1	4"	GLOBE STOP		B16.34 600#	BW ANSI B16.25		STRIPP P & DK MACHY PRESS RED. V. INLET		
F	V-146	1	1" △ 2" ⊗	PRESS. REDUCING		B16.5 600#	FLG ANSI B16.5			850/220 PSIG	
C	V-147	1	3"	GATE		B16.34 600#	BW ANSI B16.25		OUTLET		
C	V-148 ⊗	1	2½"	GLOBE STOP					BYPASS		
G	V-149 △ ⊗	1	2"x 3" 4"x 6"	ANGLE RELIEF		B16.5 300#	FLG ANSI B16.5		& DK MACHY	SET AT 245 PSIG	
	V-150	1	3"	GLOBE STOP					#1 C.O.		
D	~~V-151~~	~~1~~	~~3"~~	~~FLOW CONTROL~~					~~#1 CONTROL~~		
	V-152 ⊗	1	3"	GLOBE STOP	CARBON STEEL	B16.5 150#	FLG ANSI B16.5	*	AUX STM TO STRIPP P. #2 C.O.		ASTM A-216 GR WCB
D	~~V-153~~ ⊗	~~1~~	~~3"~~	~~FLOW CONTROL~~					~~#2 CONTROL~~		
C	V-154 ⊗	1	2"	GLOBE STOP	CARBON STEEL	B16.34 600#	SW ANSI B16.11	*	AUX STM TO CONTAM ST, PRESS RED. V. INLET		ASTM-A105
E	V-155	1	3" △ 2" ⊗	PRESS. REDUCING		B16.5 600#	FLGD ANSI B16.5			850/220 PSIG △ 850/125 PSIG ⊗	ASTM-A216 GR WCB
C	V-156 ⊗	1	2"	GATE		B16.34 600#	SW ANSI B16.11		OUTLET		ASTM A105
C	V-157	1	△ 3" ⊗ 2½"	GLOBE STOP			BW ANSI B16.25		BYPASS		ASTM-A216 GR WCB
G	V-158	1	3"	ANGLE STOP					4TH STAGE FD HTR, PRESS RED. V. INLET		
	V-159	1	2"	PRESS. REDUCING		B16.5 600#	FLGD ANSI B16.5			850/175 PSIG	
	V-160	1	3"	GATE		B16.34 600#	BW ANSI B16.25		OUTLET		
	V-161	1	2"	GLOBE STOP			SW ANSI B16.11		BYPASS		ASTM-A105
	V-162	1	4"	GATE			BW ANSI B16.25		MN FD PUMP #1 C.O.	MOTOR OPERATED, NOTE #10 & #11	ASTM-A216 GR WCB
	V-163	1	4"	GLOBE STOP							
	V-164	1	4"	GATE					#2-C.O.	MOTOR OPERATED, NOTE #10 & #11	
	V-165	1	4"	GLOBE STOP							
C	V-166 ⊗	1	5"	GATE		B16.5 150#	FLG ANSI B16.5		AUX ST TO DK MACHY AFT		

*STAINLESS STEEL AISI 410 OR AISI 416 WITH STEEL STELLITED FACED DISC & SEATS, SEE NOTE 15.

⊗ H 615C ONLY

△ H613C & H614C

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
C	V-167 ⊗	1	6"	GATE	CARBON STEEL	B16.5 150#	FLG ANSI B16.5	*	AUX ST TO DK MACHY FWD		ASTM A-216 GR WCB
	V-168	1	4"	ANGLE STOP CHECK		B16.5 300#			1ST STAGE H.P. BLEED ST OUTLET	MOTOR OPERATED SEE NOTE #9, 10, & 12	
	V-169	1	4"	GLOBE					↓ TO 5TH STAGE FD HTR		
D	V-170	1	⊗ 4" △ 6"	↓		↓	↓		1ST STAGE H.P. BLEED TO CONTAM ST GEN CONTROL VLV INLET		
D	V-171	1	⊗ 4" △ 8"	FLOW CONTROL		B16.5 300#	FLG ANSI B16.5				
D	V-172	1	⊗ 4" △ 6"	GATE					OUTLET		
	V-173	1	3" ⊗ 4" △	GLOBE STOP					↓ BYPASS		
	V-174	1	5"	ANGLE CHECK					2ND STAGE H.P. BLEED ST OUTLET	MOTOR OPERATED SEE NOTE #9, 10, & 12	
	V-175	1	↓	GLOBE		↓	↓		↓ TO 4TH STAGE FD HTR		↓
C	V-176 △	1	2"			B16.34 600#	SW ANSI B16.11		STEAM TO STRIPPING PUMP		ASTM-A-105
C	V-177 △	1	1¼"				↓		↓		↓
C	V-178 △	1	3"	↓	↓	↓	BW ANSI B16.25		AUX ST TO CONTAM ST GEN & 5th STG HEATER RED. VLV BYPASS		ASTM-A-216 GR WCB
	V-179 ⊗	1	4"	GATE	CARBON STEEL	B16.5 150#	FLG ANSI B16.5		DECK WINCH ST C.O.		ASTM A-216 GR WCB
	V-180 ⊗	1									
	V-181 ⊗	1									
	V-182 ⊗	1									
	V-183 ⊗	1									
	V-184 ⊗	1									
	V-185 ⊗	1									
	V-186 ⊗	1									
	V-187 ⊗	1							↓		
	V-188 ⊗	1							COMB WINCH & WINDLASS ST CO		
	V-189 ⊗	1	↓	↓	↓	↓	↓	↓	↓		↓

*STAINLESS STEEL AISI 410 OR AISI 416 WITH STEEL STELLITED FACED DISC & SEATS, SEE NOTE 15.

⊗ H 615C ONLY

△ H 613C & H 614C

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MICRO-MASTER 105 mm

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VALVE LIST

REV.	ITEM	NO. PER SHIP	SIZE	TYPE	MATERIAL	USAS PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MAT'L. SPEC:
C	V-190 ⊗	1	4"	GATE	CARBON STEEL	B16.5 150#	FLGD B16.5	*	DK. WINCH STM C.O.		ASTM A-216 GR WCB
C	V-191 △	1	3"	GATE		B16.34 600#	ANSI B16.25 BW		AUX STEAM TO CONTAM STEAM PRESS RED. V. OUTLET		
C	V-192 △	1	3"	GATE					AUX STEAM TO CONTAM ST GEN & 5TH STG HEATER RED VLV OUTLET		
D	V-193 ⊗	1	1"	GLOBE STOP			ANSI B16.11 SW	SST	STEAM FOR PORTABLE GAS FREEING BLOWERS		ASTM-A105
D	V-194 ⊗	1									
D	V-195 ⊗	1									
D	V-196 ⊗	1									
D	V-197 ⊗	1									
D	V-198 ⊗	1									
D	V-199 ⊗	1									
D	V-200 ⊗	1									
D	V-4000 ⊗	1									
D	V-4001 ⊗	1									
D	V-4002 ⊗	1									
D	V-4003 ⊗	1									
E	V-4004	1	10"	GATE		B16.5 150#	FLG'D		AUX STM TO TANK CLEAN HTR		
F	V-4005	1	1/2"	GLOBE STOP		B16.34 600#	ANSI B16.11 SW		EMERGENCY ST TELLTALE		

* STAINLESS STEEL ANSI 410 OR AISI 416 WITH STEEL STELLITED FACED DISC & SEATS. SEE NOTE 15.

△ H 613C & H614C ONLY

⊗ H615C ONLY

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VALVE LIST

REV.	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANS PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
F	V-4006	1	½"	GLOBE STOP	CARBON STEEL	B16.34 600#	ANSI B16.11 S.W.	SST	EMERGENCY ST TELLTALE		ASTM-A105
↓	V-4007 ⊛	1	↓	↓	↓	↓	↓	↓	ROOT C.O. V-101 PILOT		↓
↓	V-4008	1	↓	↓	↓	↓	↓	↓	↓ ↓ V-155 ↓		↓
↓	V-4009	1	↓	↓	↓	↓	↓	↓	↓ ↓ V-146 ↓		↓
↓	V-4010	1	↓	↓	↓	↓	↓	↓	↓ ↓ V-137 ↓		↓
↓	V-4011	1	↓	↓	↓	↓	↓	↓	↓ ↓ V-105 ↓		↓
↓	V-4012 ⊛	1	↓	↓	↓	↓	↓	↓	↓ ↓ V-159 ↓		↓
↓	V-4013 △	1	3"	PRESS REDUCING	↓	↓	BW ANSI B16.25	↓	FEED PMP SPEED CONTROL V		ASTM A-216 GR WCB
↓	V-4014 △	1	3"	PRESS REDUCING	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓		ASTM A-216 GR WCB
↓	V-4015	1	½"	GLOBE STOP	↓	↓	ANSI B16.11 S.W.	↓	ROOT C.O. FOR PRESS CONTROLLER TK CLEAN HTR		ASTM-A105
↓	V-4016 ⊛	1	½"	↓	↓	↓	↓	↓	ROOT C.O. V-123 PILOT		↓
↓	V-4017	1	¾"	↓	↓	↓	↓	↓	ST TO CARGO P. #1 GLAND SEAL		↓
↓	V-4018	1	↓	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ #2 ↓ ↓		↓
↓	V-4019	1	↓	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ #3 ↓ ↓		↓
↓	V-4020	1	↓	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ #4 ↓ ↓		↓
↓	V-4021	1	1"	↓	↓	↓	↓	↓	↓ ↓ BALL.P ↓ ↓		↓
↓	V 4022	1	1"	↓	↓	↓	↓	↓	↓ ↓ CARGO & BALL P ↓ ↓		↓
	V4023 ⊛	1	3"	↓	↓	B16.5 150#	FLGD. B16-5	↓	ST- TO SLOP TK. HTG COIL #3		ASTM A 216 GR WCB
	V4024 ⊛	1	3"	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ #4		↓
	V4025 ⊛	1	1½"	↓	↓	B16-34 600#	ANSI B16.11 S.W.	↓	↓ ↓ ↓ ↓ ↓ #5		ASTM A105
	V4026 ⊛	1	2"	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ 1A		↓
	V4027 ⊛	1	2"	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ 1B		↓
	V4028 ⊛	1	2"	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ 1C		↓

△ H613C & 614C ONLY
⊛ H615C ONLY

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANS PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V4029 ⊛	1	2"	GLOBE STOP	CARBON STL	B16.34 600#	ANSI B16.11 S.W.	SST	STM TO SLOP TK HTG COIL #2A		ASTM-A-105
	V4030 ⊛	1							#2B		
	V4031 ⊛	1							#2C		
	V4032 ⊛	1							#3A		
	V4033 ⊛	1							#3B		
	V4034 ⊛	1							#3C		
	V4035 ⊛	1							#4A		
	V4036 ⊛	1							#4B		
	V4037 ⊛	1							#4C		
	V4038 ⊛	1	1½"						#5A		
	V4039 ⊛	1							#5B		
	V4040	1		CONTROL			FLG ANSI B16.5	*	AUX ST TO STBD REGENERATIVE AIR HEATER SOOT BLOWER	FURN WITH BLR	
	V4041	1							AUX ST TO PORT REGENERATIVE AIR HEATER SOOT BLOWER		
	V5056 ⊛	1	4"	GATE		B16.5 150#		SST	COMB WINCH & WINDLASS ST C.O.		ASTM-A105
	V5057 ⊛	1	4"								
G	V4042 ⊛	1	½"	GLOBE STOP		B16.34 600#	SW ANSI B16.11		DECK MACHY PIPE WARM-UP		
J	V 4043	1	1"	SOLENOID					AUX ST TO TURBO GEN GLAND SEAL SOLENOID VALVE	SEE NOTE #19	
	V4044	1	1"	GLOBE STOP					AUX ST TO TURBO GEN GLAND SEAL SOLENOID V. OUTLET		
	V4045	1	1"						AUX ST TO TURBO GEN GLAND SEAL SOLENOID V. BYPASS		
	V4046	1	¾"						STM TO SOOT BLOWER CONNECTIONS ON BOILER UPTAKE VALVES		
	V4047	1	¾"								
	V4048	1	¾"						ROOT C.O. FOR STM TO SOOT BLOWER CONNECTIONS ON BOILER UPTAKE VALVES		

⊛ H615C ONLY
* STAINLESS STEEL AISI 410 OR AISI 416 WITH STEEL STELLITED FACED DISC & SEATS, SEE NOTE 15.

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INSTRUMENT LIST

	INST NO	SERVICE	SIZE	RANGE PSI	
	G-35	AUX ST DESUPHTR OUTLET STBD BLR	—	0-1200	△
	G-36	↓	-	↓	*
	G-37	PORT	—		△
	G-38	↓	-	↓	*
Ⓓ	~~G-39~~ ⊗	~~TO WHISTLE~~	~~4 1/2"~~	~~0-300~~	
	G-40	CONTAM ST GEN	↓	0-500	
	G-41	AIR EJECTORS	↓	0-300	
	G-42	↓	-	↓	*
	G-43	MN AIR EJECTOR	4 1/2"	↓	
	G-44	DSTL PLANT #1 AIR EJECT	↓	↓	
	G-45	#2	↓	↓	
	G-46	AUX ST AUG TO AUX EXH	↓	0-100#	
	G-47	TO MN FD PUMP #1	↓	0-1500	
	G-48	#2	↓	↓	
	G-49	BLR ATOMIZING	4 1/2"	0-300	
	G-50	↓	-	↓	*
	G-51	TK CLEAN HTR	4 1/2"	0-300	
	G-52	FIRE PUMP	↓	0-1500	
Ⓒ	G-53 ⊗	SLOP TK HTG COIL	↓	0-300	
Ⓓ	~~G-54~~	~~AUX AIR EJECTOR~~	↓	↓	
	G-55	DK MACHY	↓	0-400	
	G-56	2ND HP TURBINE BLEED	↓	0-600	
Ⓙ	~~G-57~~	↓	—	↓	*

	INST NO	SERVICE	SIZE	RANGE °F	
	T-15	AUX ST DESUPHTR OUTLET STBD BLR		200-1000	
	T-16	↓		200-1000	*
	T-17	PORT		200-1000	
	T-18	↓		↓	*
Ⓗ	~~T-19~~	~~TO DK MACHY~~		~~150-750~~	
	T-20	AUG TO CONTAM ST		↓	
	T-21	TO STRIPPING PUMPS		↓	
	T-22	PUMP #1		↓	
	T-23 ⊗	#2		↓	
	T-24	1ST H.P. TURBINE BLEED		200-1000	
	T-25	2ND H.P. TURBINE BLEED		↓	
	T-26 ⊗	ST TO SLOP TK HTG COILS		150-750	
Ⓙ Ⓕ ↓	T-27 ◬	2ND STG H.P. BLEED TO 4th STG FD HTR		200-1000	*
	T-28 ◬	1ST STG H.P. BLEED TO 5TH STG FD HTR		200-1000	*
	T-29 ◬	AUX ST AUG TO AUX EXH		150-750	*

	INST NO	SERVICE	SIZE	RANGE	
	G-58	AUX ST TO 4TH STAGE FEED HTR	4 1/2"	0-300	
	G-59	STRIPPING PUMPS	↓	0-400	
	G-60	PUMP #1	↓	↓	
	G-61	↓	↓	↓	▲
	G-62 ⊗	#2	↓	↓	
	G-63 ⊗	↓	↓	↓	▲
	G-64	AVG TO CONTAM ST SYS	↓	0-200	
	G-65	1ST H.P. TURBINE BLEED	↓	0-600	
Ⓙ	~~G-66~~	↓	–	↓	*
Ⓔ	G-67	AUX STM TO TK CLEAN HTR	4 1/2"	0-300	

*LOCATED IN E.O.S.
▲ LOCATED IN CARGO PUMP CONTROL ROOM
△ LOCATED AT LOCAL BURNER CONTROL STATION
⊗ H615C ONLY

◬ H613 & H614 ONLY

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FLOW DATA TABLE

	SYM	SIZE INCHES	NOM PRESS	FLOW LB/HR	VEL FT/SEC	CONDITION	SERVICE
	A	5"		80000 10990	125 21	RATED ABS POWER	DESUPERHEATED STEAM LOOP
	B	4"		27700 20400	53 39	RATED ABS POWER	STEAM TO MAIN FEED PUMP
	C	2-1/2"		7500	50	RATED	STEAM TO FIRE PMP
	D	1"		1050	42	RATED	STEAM TO ATOMIZERS
	E	3"		21000	81	ASTERN	AUGMENT TO 4TH STAGE FEED HEATER
	F	5"		19600	117	ABS POWER	H.P. BLEED TO 4TH STAGE FEED HEATER
Ⓒ H615C ONLY H613C & H614C	G	3" 4"		30300 65000	118 143	ASTERN	AUGMENT TO 5TH STAGE FEED HEATER & CONTAM STEAM GEN
	H	4"		17500	105	ABS POWER	H.P. BLEED TO 5TH STAGE FEED HEATER & CONTAM. STEAM GEN
H615C ONLY H613C & H614C	I	4" 2"		42000 9300	99 86	PORT PUMPING	STEAM TO STRIPPING PUMPS & DECK MACHY STEAM TO STRIPPING PUMP
Ⓒ H615C ONLY →	J	6"		24300	68	◒	REDUCED PRESS STEAM TO DECK MACHY (FWD)
H-615C ONLY →	K	5"		22000	101	RATED - 2 PUMPS	REDUCED PRESS STEAM TO STRIPPING PUMPS
Ⓗ	L	5"		85000	132	RATED	SUPPLY TO TANK CLEANING HEATER
H615C ONLY →	M	5"		32,000	176	RATED	SUPPLY TO SLOP TANK HEATING COILS
	N	1-1/2"		650	42	RATED	REDUCED PRESS STEAM TO MAIN AIR EJECTOR
Ⓓ	~~O~~	~~1-1/2"~~		~~500~~	~~32~~	~~RATED~~	~~REDUCED PRESS STEAM TO AUX AIR EJECTOR~~
	P	2-1/2"		3150	86	1.5 X DESIGN CLEARANCE	REDUCED PRESS STEAM TO MAIN GLAND SEAL
	Q	1"		235	36	2 X DESIGN CLEARANCE	REDUCED PRESS STEAM TO TG GLAND SEAL
Ⓓ	R	1½"		330	21	RATED	REDUCED PRESS STEAM TO DIST PLANT AIR EJECTOR
H-613C & H-614C →	K	3"		9300	107	RATED- 1 PUMP	REDUCED PRESS STEAM TO STRIPPING PUMP

◒ TWO WINCHES AT FULL LOAD
ONE WINCH AT LIGHT LINE SPEED.

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DESIGN CHARACTERISTICS

	SERVICE	WORKING PRESS	WORKING TEMP	DESIGN PRESS	DESIGN TEMP	HYDRO TEST PRESSURE
	BOILER PRESS DESUPHTD STEAM	847 PSIG	543°F	950 PSIG	590°F	1425 PSIG
	FIRST STAGE H.P. BLEED	355 PSIG	767°F	400 PSIG	767°F	600 PSIG
	SECOND STAGE H.P. BLEED	207 PSIG	653°F	230 PSIG	653°F	345 PSIG
Ⓒ H615C ONLY→	REDUCED PRESS AUX STEAM TO STRIPPING PUMPS & DECK MACHY	220 PSIG	400°F	245 PSIG	400°F	368 PSIG
Ⓒ	REDUCED PRESS AUX STEAM TO AIR EJECTORS, AND , ATOMIZING STEAM,	150 PSIG	400°F	168 PSIG	493°F	252 PSIG
Ⓒ H615C ONLY→	REDUCED PRESS AUX STEAM TO SLOP TANK HEATING COILS	150 PSIG	410° F	168 PSIG	425°F	252 PSIG
Ⓒ H615C ONLY→	REDUCED PRESS AUX STEAM TO CONTAM STEAM SYSTEM	125 PSIG	365°F	150 PSIG	380°F	225 PSIG
Ⓒ H613C & H614C→	RED. PRESS STEAM TO STRIPPING PUMP	220 PSIG	400° F	245 PSIG	400° F	368 PSIG
Ⓒ H613C & H614C→	RED. PRESS STEAM TO CONTAM STEAM SYS	220 PSIG	400° F	242 PSIG	410° F	363 PSIG
Ⓗ	REDUCED PRESS. AUX. STEAM TO TANK CLEANING HEATER	100 PSIG	478° F	110 PSIG	480° F	165 PSIG

HULL NO. 613C, 614C, 615C	DWG NO. 6450-684	REV. H
		SHEET 13

MN 13-11X17 (REV. 1)

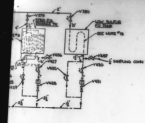
K&E 191253 5-74 W 2847A•

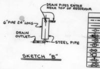
6450-684

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

4X

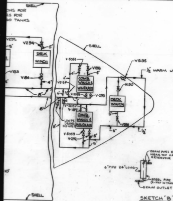

2"
V379
V380
STBD F.O. STORAGE TK
LOW SULFUR FO TANK
SEE NOTE #13
4"
"C"
"D"
V496
V497
¼" SAMPLING CONN TYP
V427
V430
V432
V428
V431
V429
2½"
1½"


DRAIN PIPES ENTER NEAR TOP OF RESERVOIR
6" PIPE 24" LONG
DRAIN OUTLET
STEEL PIPE

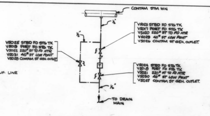
SKETCH "B"

DRAINS & FEED	THERMOSTATIC CONTROL VALVE
STEAM	STRAINER
ORIFICE	CONTROL VALVE (LEVEL)
STOP CHECK VALVE (LOCKED OPEN)	GATE VALVE
PRESSURE GAGE (LOCAL)	RELIEF VALVE
TRAP	STOP CHECK VALVE
HOSE VALVE	STOP VALVE
SALINITY CELL	
STOP VALVE (LOCKED CLOSED)	
PRESSURE REDUCING VALVE	

DIAGRAM H615 ONLY
CONTAMINATED STEAM GENERATING
SYSTEM ARR


SHELL
ONS FOR
RS FOR
GO TANKS
V295
V294
5"
DECK WINCH
V183
V184
4"
8"
SHELL
V-5056
V188
V513P
6"
COMB. WINCH & WINDLASS
V-5058
V-293
V-5057
V-189
LOW PT. DRAINS SEE NOTE
V-5059
V-292
V513S
½" WARM UP LINE
V190
DECK WINCH
V291
½"
10"
SHELL
DRAIN PIPES ENTER NEAR TOP OF RESERVOIR
6" PIPE 24" LONG
STEEL PIPE (X-HVY IN TANK)
DRAIN OUTLET

SKETCH "B"


CONTAM STM MN
½"
V5023 STBD FO STG TK
V5017 PORT FO STG TK
V5020 220# ST TO FO HTR
V5029 40# ST LOW POINT
V5026 CONTAM ST GEN. OUTLET.
V5025 STBD FO STG TK
V5019 PORT FO STG TK
V5022 220# ST TO FO HTR
V5031 40# ST LOW POINT
V5028 CONTAM ST GEN. OUTLET
V5024 STBD FO STG TK
V5018 PORT FO STG TK
V5021 220# ST TO FO HTR
V5030 40# ST LOW POINT
V5027 CONTAM ST GEN. OUTLET.
TO DRAIN MAIN

SK "A-A" TYP
TYP LOW POINT CONTAM STEAM DR

SYMBOL LIST

DRAINS & FEED	THERMOSTATIC CONTROL VALVE
STEAM	STRAINER
ORIFICE	CONTROL VALVE (LEVEL)
STOP CHECK VALVE (LOCKED OPEN)	GATE VALVE
PRESSURE GAGE (LOCAL)	RELIEF VALVE
TRAP	STOP CHECK VALVE
HOSE VALVE	STOP VALVE
SALINITY CELL	TRAP WITH INTEGRAL STRAINER
STOP VALVE (LOCKED CLOSED)	SWING CHECK VALVE
PRESSURE REDUCING VALVE	

DIAGRAM H613 & H614 ONLY
CONTAMINATED STEAM GENERATING
SYSTEM ARR

REVISIONS

NN C.O. #	REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
—	A	—	INITIAL ISSUE	[illegible]	[illegible]	—	—
613C/614C 12	B	—	PLAN COMPLETELY REDRAWN FOR H613C & H614C				
—		—	DRAIN COOLERS RELOCATED TO SUIT STEAM GENERATOR VENDOR'S RECOMMENDATION				
—		—	SIZE OF FEED PUMP SUCTION WAS 2½". GENERATOR BLOW DOWN WAS 1½". V498, V499, V500 & V501 (SEA CHEST STEAMOUT) ADDED. V528 ADDED AT INERT GAS SEAL UNIT, DESIGN DEVELOPEMENTS.	1/3/75	[illegible]		
G13C & G14C 12	C	—	ADDED EXHAUST STEAM OIL SEPARATOR DRAINS. ALTERED SLOP TANK DRAINS.				
G13C & G14C 41		—	ADDED HOSE CONNECTIONS ON DECK STEAM FOR PORTABLE BLOWERS FOR GAS FREEZING CARGO OIL TANKS. RBW	[illegible]	[illegible]		
—	D	—	VALVE NO'S CHANGED V5000-V5003 WERE V565-V568. RJP ADDED V5032 ST OUT FOR SEWAGE HOLDING TK				
G13C G14C 10		—	DELETED: TWO DECK WINCH FWD OF ENG RM ADDED: ONE DECK WINCH AFT ENG BHD & ADDITIONAL STM CONN TO COMB WINCH & WINDLASS LAM (H613C & 614C)				
			ADDED ST OUT FOR SEA CHESTS LOCATED IN CARGO PUMP ROOM				
			ADDED LOW POINT DRAINS & SK "A-A" FOR HULL G13C				
			ALTERED PIPING LEADS TO SUIT SHIPS ARR & VALVE V512 WAS MOTOR OPER FOR HULL G13C & G14C				
			ADDED VALVE IN SENSING LINE FOR VALVES V505 & V393. PRESS GAGE G78 IS SHOWN ON REF 2 & DELETED FROM THIS DWG.				
			ALTERED HTG COILS IN F.O. STORAGE TANKS				
H613C & 614C 76			(H-613C & 614C) ALTERED SLOP TANK HTG COILS.	[illegible]	[illegible]		
	E		(613C & 614C) ADDED VALVES V-5054, V-5055 & V-5069. CHANGED VALVE NO. V-184, V-186 & V-287 TO V-5056, V-5057 & V-5059 RESPECT. ADDED 4" SHORE CONNECTION. CHANGED WINDLASS SUPPLY PIPING FROM 8" TO 6".				
			(615C) ADDED 4" SHORE CONN. & VALVE V-5069				
			(613C & 614C) REVISED SCHEME OF STM & EXH TO WINDLASSES & FWD WINCH TO AGREE WITH ARRGT DWG.				
			ADDED T-41 THRU T-43	[illegible]	[illegible]	—	—
	F		ALTERED V522 TO ¾" FROM 1" & ADDED V522A, V522B, & V522C FOR H613C & H614C ONLY				
			ALTERED PIPING RUNS FROM STRIP PUMP & DECK EXH-OIL SEPARATORS, ADDED V5070 & V5071. (613C & 614C)				
			DECK MACH'Y DRAINS FROM AUX. COND. PUMP TO CONTAMINATED DRAIN INSPECTION TANK WAS 4" (613C & 614C)	[illegible]	[illegible]	—	—
	G		ADDED ¼" PRESSURE SENSING LINE FOR HEATING STEAM AIR CONTROL PILOT ADDED V-5072				
			ADDED OILY WATER SEPERATOR ON MN DK	[illegible]	[illegible]	—	—
	H		ADDED ¾" VENT FROM RESERVOIR FOR PORT & STBD F.O. STORAGE TANKS.				
			DELETED T-43 GER				
			ADDED V485A, B & C TO DEOILER				
			G-83 FOR DK MACHY EXH WAS G-81 & VP GAGE 3.	[illegible]	[illegible]		
	J	—	ADDED DRAINS FROM STEAM SUPPLY TO OIL SAMPLE CHAMBERS	[illegible]	[illegible]	—	—

AUTHORITY:

GENERAL NOTES:

FOR LIST OF MAT'L, NOTES & REF SEE NN DWG 6450-693

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS SHELL LTR OF 12/17/74
ZAPATA LTR OF 12/2/74
ABS NOT REQD
USCG LTR OF 2/5/75

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
MACHINERY DESIGN DEPT.

SCALE NONE = 1 FT
DRAWN L.A. McNEIL
CHECKED T.F. SEAMAN
SECT MGR J. [illegible]
DATE COMPL. 10-28-74
EXAMINED
AUTHORIZED EBS
DATE 11-6-74
TECH APPROVAL [illegible] On Cap 11/6/74
CSD APPROVAL EBS FOR J.R. WUNSTEAD

DIAGRAM
CONTAMINATED STEAM GENERATING
SYSTEM ARR

USMA DESIGN MA/MSB317, MA/MSB320, MA/MSB 332
USMA DWG NO. —
HULL NO. —
DWG NO. 6450-692
REV J
SHEET NO. 1 OF 1

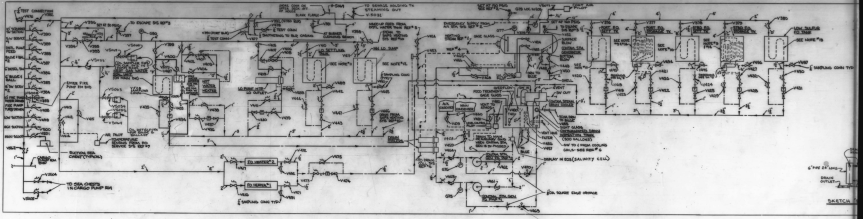
NO. | REFERENCES | DWG NO.

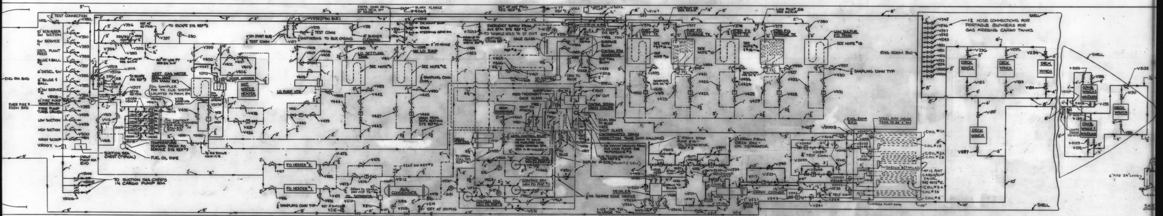
DWG. REV.—HULL APPLIC

REV	NN HULLS ONLY					
A	YES	YES	YES			
B	YES	YES	YES			
C	YES	YES	NO			
D	YES	YES	YES			
E	YES	YES	YES			
F	YES	YES	NO			
G	YES	YES	YES			
H	YES	YES	NO			
J	YES	YES	NO			

REPRODUCTION OFFICE
YARD PRINTS YES
GROUPING NO
REMARKS
DATE 12-11-8
GROUP:

6450-692
MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 1
10X


TEST CONNECTION
TO ESCAPE SYS REF #3
SHORE CONN ON UPPER DECK AFT OF HOUSE
BLANK FLANGE
TO SEWAGE HOLDING TK STEAMING OUT
SET AT 150 PSIG
CONT AIR PILOT
10" SCRUBBER SW SUCTION
SW SERVICE
DSTL PLANT FEED
BILGE & BALL
6" DIESEL SW
8" SW SERV
10" FIRE PUMP MOTOR DRIVEN
LOW SUCTION
HIGH SUCTION
MAIN SCOOP
EMER FIRE PUMP RM BHD
HOT WATER HEATER
LO SETTLING TANK
MN LO SUMP
LO PURIF HTR
SUCTION SEA CHEST (TYPICAL)
CARGO PUMP RM BHD
TO SEA CHESTS IN CARGO PUMP RM
FO HEATER #2
FO HEATER #1
SAMPLING CONN TYP
EMERGENCY SUPPLY FROM AUX STM SYS REF #2
GAGE GLASS
SURFACE BLOW
CONTAM STM GENERATOR
BOTTOM BLOW
FEED TREATMENT GAGE GLASS
OVERFLOW
MAIN CONDENSER
VENT TO ATMOS
CONTAM STEAM DRAIN COOLER
CONTAMINATED DRAIN INSPECTION TANK (300 GALLONS)
DISPLAY IN EOS (SALINITY CELL)
CONTAM STM GEN FO PMP #2
CONTAM STM GEN FO PMP #1
DIA SQUARE EDGE ORIFICE
PORT FO SETT TK
PORT FO STORAGE TK
STBD FO SETT TK
STBD FO STORAGE TK
LOW SULFUR FO TANK
SEE NOTE #13
SAMPLING CONN TYP
6" PIPE 24" LONG
DRAIN OUTLET
SKETCH


TEST CONNECTION
10" SCRUBBER SW SUCTION
SW SERVICE
DSTL PLANT FEED
BILGE & BALL
6" DIESEL SW
8" SW SERVICE
10" FIRE PUMP MOTOR DRIVEN
FIRE PUMP TURB DRIVEN
LOW SUCTION
HIGH SUCTION
MAIN SCOOP
ENG RM BHD
EMER FIRE P ROOM BHD
SUCTION SEA CHEST (TYPICAL)
FUEL OIL PIPE
CARGO PUMP RM BHD
TO SUCTION SEA CHESTS IN CARGO PUMP RM
TO ESCAPE SYS REF #3
INERT GAS WATER SEAL UNIT (ON MAIN DK)
OIL SAMPLER FOR TK CLN SYSTEM LOCATED IN FOAM RM
TEMPERATURE SENSING FROM FO SERVICE SYS REF #7
HOT WATER HEATER
LO PURIF HTR
LO SETTLING TANK
MN LO SUMP
FO HEATER #2
FO HEATER #1
AUX CONDENSER
SAMPLING CONN TYP
SET AT 50 PSIG
EMERGENCY SUPPLY FROM AUX STM SYS REF #2
TO SEWAGE HOLD TK ST OUT
HEATING STEAM REF #2
GAGE GLASS
SURFACE BLOW
CONTAM STM GENERATOR
BOTTOM BLOW
FEED TREATMENT GAGE GLASS
OVERFLOW
MAIN CONDENSER
VENT TO ATMOS
CONTAM STEAM DRAIN COOLER
CONTAMINATED DRAIN INSPECTION TANK (300 GALLONS)
DISPLAY IN EOS (SALINITY CELL)
CONTAM STM GEN FO PMP #2
CONTAM STM GEN FO PUMPS
DIA SQUARE EDGE ORIFICE
DEOILER
DRAIN COOLER
1-1/2" DR TO SLUDGE TK
PORT FO SETT TK
PORT FO STORAGE TK
STBD FO SETT TK
STBD FO STORAGE TK
LOW SULFUR FO TANK
SEE NOTE #13
SAMPLING CONN TYP
ENG ROOM BHD
STEEL PIPE INSIDE TANK TO BE 6" x 10"
COIL #1A
COIL #1B
COIL #2A
COIL #2B
COIL #3A
COIL #3B
COIL #4
CARGO PUMP ROOM
12 HOSE CONNECTIONS FOR PORTABLE BLOWERS FOR GAS FREEING CARGO TANKS
DECK WINCH
COMB WINCH & WINDLASS
SHELL
6" PIPE 24" LONG
SKET

6450-692

MICRO-MASTER 105 mm

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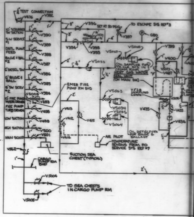
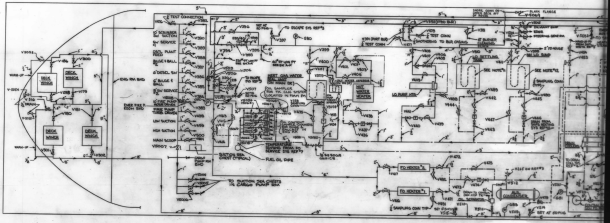
SEPT. '80

10X

FRAME 2


TEST CONNECTION
V382
10" SCRUBBER SW SUCTION
S/W SERVICE
DSTL PLANT FEED
BILGE & BALL
6" DIESEL SW
6" BILGE & BALL
8" SW SERV
10" FIRE PUMP MOTOR DRIVEN
FIRE PUMP TURB DRIVEN
LOW SUCTION
HIGH SUCTION
MAIN SCOOP
SET AT 50 PSIG
TO ESCAPE SYS REF #3
G80
EMER FIRE PUMP RM BHD
AIR PILOT
TEMPERATURE SENSING FROM FO SERVICE SYS REF #7
OIL DETECTOR FOR BILGE & BALLAST
SUCTION SEA CHEST (TYPICAL)
CARGO PUMP RM BHD
TO SEA CHESTS IN CARGO PUMP RM
V5004
V5005


DECK WINCH
DECK WINCH
DECK WINCH
DECK WINCH
WARM-UP
WARM-UP
V5053
V-5054
V-5055
V316
V179
V180
V181
V186
V300
V301
V302
ENG RM BHD
EMER FIRE P. ROOM BHD
TEST CONNECTION
10" SCRUBBER SW SUCTION
SW SERVICE
DSTL PLANT FEED
BILGE & BALL
6" DIESEL SW
6" BILGE & BALL
8" SW SERVICE
10" FIRE PUMP MOTOR DRIVEN
FIRE PUMP TURB DRIVEN
LOW SUCTION
HIGH SUCTION
MAIN SCOOP
SET AT 50 PSIG
TO ESCAPE SYS REF #3
G80
INERT GAS WATER SEAL UNIT (ON MAIN DK)
OIL SAMPLER FOR TK CLN SYSTEM LOCATED IN PUMP RM
HOT WATER HEATER
LO PURIF HTR
LO SETTLING TANK
SEE NOTE #12
SEE NOTE #12
MN LO SUMP
SAMPLING CONN (TYP)
DRAIN FROM SHIPS HEATING SYS REF #10
TEMPERATURE SENSING FROM FO SERVICE SYS REF #7
FUEL OIL PIPE
SUCTION SEA CHEST (TYPICAL)
CARGO PUMP RM BHD
TO SUCTION SEA CHESTS IN CARGO PUMP RM
SHORE CONN ON UPPER DECK AFT OF HOUSE
BLANK FLANGE
SMOTHERING TO BLR CASING
AT BURNER CLEANING BENCH
TEST CONN
FO HEATER #2
FO HEATER #1
AUX CONDENSER
OIL SEPARATOR
SAMPLING CONN TYP
SET AT 80 PSIG

6450-692

MICRO-MASTER 105 mm

K+E

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10X

FRAME 3

ENB VAULT X-182

6450. 693

REV. STATUS OF SHEETS																						
REV.	J	J	A	H	G	H	H	A	H	H	H	H	B	H	H	E	F	F	E	E	J
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	11A	11B	11C	11D	11E	11F	11G
REV.																					
SHEET																					

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APP'D.
		SEE SHEET 2				

FOR ARR SEE NN DWG № 6450-692

GROUP

MC NO.

DWG. REV. — HULL APPLIC.

REV.	NN HULLS ONLY 613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	YES
E	YES	YES	YES
F	YES	YES	NO
G	YES	YES	YES
H	YES	YES	NO
J	YES	YES	NO

NNS & DD Co. HULL NO.	MARAD HULL NO.	USMA DESIGN
615C	311	MA/MSB 332
614C	310	MA/MSB 320
613C	309	MA/MSB 317

SHIP'S NAME

APPROVALS

OWNERS SHELL LTR OF 12/17/74
ZAPATA LTR OF 12/2/74

ABS NOT REQD

USCG LTR OF 2/5/75

Newport News Shipbuilding
A Tenneco Company
TENNECO
FSCM NO. 43689
Commercial Ship Division
— DESIGN DIVISION DEPT. MACHINERY DESIGN

GROUPED: CHK. / BY.
DATES: COMP. / PART
HULL ___ GROUP NO. / KEY

TYPE OF DWG. —

SCALE: NONE = 1 Ft.
DRAWN: M D STAIR
CHECKED: T.E. SEAMAN
SECT. MGR. J H Johnson

DATE COMPL. 10-28-74
EXAMINED:
AUTHORIZED: EB
DATE 11-6-74

TECH. APPROVAL HJC SAW 11/6/74 VRS 11/6/74 Om Cox 11-6-74

CSD APPROVAL EBF FOR J.R. WINSTEAD

TITLE
DIAGRAM
CONTAMINATED STEAM GENERATING SYS
LIST

DWG. NO. 6450-693
REVISION J
SHEET NO. 1 OF 14

M7 11 X 17

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 12-14-8 SIGNED J H Johnson

YARD PRINTS

FIRST ISSUE	DEPT.	NO. PRINTS
	AH	
	BL	
	BR	
	EL	
	FP	
3-2-77	MI	4
	ML	
	MS	
12-14-78	PC	1
	PM	
3-2-77	PS	12
	PN	
	RD	
	RM	
	MIR	
	SH	
	SM	
	TM	
	WD	
	WE	
	WM	
	X16	

ORDERED BY DESIGN

FIRST ISSUE	DEPT.	NO. PRINTS
3-2-77	SEPIA/RD	1
	J+J	1
	JEA	1
	E34	1
	LWC	1
	E	1
	RGH	1
	E11	1
	CSD-V	1
	KSD	1
11-21-77	BR/SHELL	2
3-2-77	USCG	2
2-17-78	ABS/LOCAL	2

SPECIAL PRINTS

REV.	DATE ISSUED
	9-16-75
	10-21-75
D	3-2-77
E	9-30-77
F	11-21-77
G	2-17-78
HJ	12-14-78

6450-693

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SEPT. '80

4X

REVISIONS

COST CHG NO. NN	COST CHG NO. OWNERS	REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
☒	☒	A	ALL		INITIAL ISSUE	10/28/74	JKJ	-	—
12 H613C H614C		B	5		MATL SCH UPDATED FOR H613C & H614C	9/2/5	MVS 9-5-75 JKY	—	-
—	—		4		NOTE 16 ADDED				
12 H613, H614			6		V375 WAS 4" 150# FOR H613C & H614C				
—	-		9		V448 & V449 WERE 1½"				
12 H613C H614C			9		V450 MARKED H615C ONLY. V452 WAS SET AT 160# FOR H613C & H614C.				
—	—		11		DESIGN DEVELOPEMENT ADDED V498 THRU V501				
12 H613C H614C			11		V502 THRU V512 ADDED FOR H613C & H614C ONLY.				
↓			11A		V513 THRU V527 ADDED FOR H613C & H614C ONLY				
—	—		11A		DESIGN DEVELOPEMENT ADDED V528.				
12 H613C H614C	—		11B		V166 THRU V299 ADDED FOR H613C & H614C ONLY.				
↓	-		11C		V300, V301 & V302 ADDED FOR H613C & H614C ONLY.				
	-		12		ADDED G81 & G82 FOR H613C & H614C ONLY.				
	-		13		DATA ALTERED FOR H613C & H614C				
↓	-		14		DATA ALTERED FOR H613C & H614C.				
12 H613C H614C	—	C	11A 11C		ADDED V532, V533, V534 & V535 ADDED V536 THRU V544 (H613C & H614C)	10/16/5	JKY	—	—
41 H613C H614C	—		11C 11D		ADDED V545 THRU V556 (H613C & H614C).				
12 H613C H614C	—		11D		ADDED V557 & V558 (H613C & H614C) RBW				
—	—	D	11C 11D		VALVE NO CHANGED V5000 WAS V555 VALVE NO'S CHANGED V5001 - V5003 WERE V556 - V558. RJP	2/23/7	JKJ	—	—
			5		STEAM PIPE ON DECK TO DECK MACHY MADE X-HVY.				
			7		STRAINER ADDED IN V406 H.M.C.				
#76 613C 614C		D	4		ALTERED WORDING & LENGTHS OF PIPING OF NOTE # 15; ALTERED NOTE #14 & #9				
—	—		6,9 11 11D		ADDED: SIZE OF V397, 452 & 507 DELETED: MOTOR OPERATOR ON V512 ADDED: VALVES V5024 THRU V5036 DLH				
H613 #76			11E 11F		ADDED V5037 THRU V5052				
#10 H613C H614C	—		11B		DELETED: V187, & 299 DLH H.M.C.				
			11F		ADDED V5053				
	—	E	11B		ADDED V-5069 (FOR 613C, 614C & 615C).	9/23/7	AC JKJ	—	-
			11F		ADDED V-5054 THRU V-5061 FOR 613C & 614C				
			14		INCREASED DECK MACHINERY EXHAUST DESIGN TEMP & PRESS & HYDRO TEST PRESS.				
			11A		V513P & V513S WERE V513. VALVE ADDED TO SUIT DESIGN DEV. UPDATED INFO. FOR V514 & V515.				
			6,9		REVISED SIZE FOR V397 & V452 WDB				
			11D 11E		APPLICABILITY OF VLVS V-5017 THRU V5025 (INCLUSIVE) EXTENDED TO H615C. GLB				
			4		ADDED NOTE 17. JGB				
		F	11A		ALT'D: V522 WAS 1", V533 WAS 1" GLOBE STOP CHECK. V535 WAS 1¼ GLOBE STOP CHECK. (613C & 614C) WJG	11/8/7	AC JKJ	—	—
			11C		ALT'D: V536, WAS 1½" GLOBE STOP (613C & 614C)				
			11D		ALT'D, V5011 WAS 1" ANGLE STOP CHECK & V5012 WAS 1" GLOBE STOP CHECK. (613C & 614C)				
			11G		ADDED SHEET 11G. WJG				
		G	11G 10		ADDED V-5072, V5073 & V5074 MATL CORRECTED FOR V482, V483 & V484	2/14/8	JKJ	—	—
		H	14	-	INFORMATION ADDED TO "DESIGN CHARACTERISTICS" TABLE H613C & H614C ONLY GER	10/6/8	JKY		
			12	-	DELETED T-43, ADDED G-83 GER/WJG				
			10	-	ADDED V485A, B & C				
			4	-	ADDED NOTE NO. 18.				
			9	-	ADDED NOTE NO. 18 TO REMARKS FOR V453 & V458. ADDED SIZE TO V461 THRU V466.				
			6	—	ADDED SIZE TO V393.				
			7	—	ADDED SIZE TO V401 & V412.				
			10	—	ADDED SIZE FOR V467 & V468.				
			11	—	ADDED SIZE FOR V506.				
			11A	-	ADDED SIZE FOR V523. ADDED SIZES & MAT'L SPEC. FOR VALVES V529, V530 & V531. WJG				
		J	11G	-	ADDED V5075 - V5081 ERS	12/11/8	JKJ		

DIAGRAM CONTAM ST GEN SYS-LIST	HULL NO. 613C, 614C, 615C	DWG. NO. 6450-693	REV. J SHEET 2

MN11-11 X 17 (REV. 1)

K&E 19 1253 10-71 2236•

880

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11	INSTRUMENT LIST
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REFERENCES

NO.	TITLE	DWG NO.
1	CONTRACT GUIDANCE DIAGRAM OF CONTAM STEAM SYS	216558
2	DIAG AUX STEAM SYS-ARR	6450-683
3	DIAG AUX EXH, BLEED ST & RELIEF VLV ESCAPE-ARR	6451-471
4	DIAG DRAIN COLL-ARR	6555-464
5	DIAG CNDS RES & MAKE-UP FD-ARR	6552-380
6	DIAG MN & AUX SEA WTR CIRC-ARR	6550-360
7	DIAG F.O. & D.O. SERV, FILL & TRANS-ARR	6950-98
8	DIAG OF FIRMAIN, SYS-ARR	2400-959
9	DIAG BILGE & BALLAST SYS-ARR	2280-691
10	SERVICE STEAM DIAG	2652-252
11	DIAG DISTILLING PLANT SYS-ARR	6557-88
12	TYP ARR OF GAGE PIPING	6750-481
13	DIRECTIONS FOR INSULATING & LAGGING OF PIPES & AUX IN E.R.	257323

DIAGRAM CONTAM ST GEN SYS-LIST	HULL NO.613C,614C,615C	DWG. NO. 6450-693	REV. A
			SHEET 3

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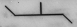
GENERAL NOTES

1. ALL PIPE SIZES SPECIFIED ARE NOMINAL I.P.S. OUTSIDE DIAMETER.
2. MANUFACTURING PROCEDURES AND MATERIAL CERTIFICATION FOR PIPES, VALVES AND FITTINGS ARE TO BE IN ACCORDANCE WITH U.S. COAST GUARD AND AMERICAN BUREAU OF SHIPPING RULES.
3. THE THICKNESS SHOWN IN THE "CALCULATED MIN. THK." COLUMN OF THE PIPE LIST IS THE MINIMUM THICKNESS ALLOWABLE AFTER ALL PIPE END PREPARATION IS COMPLETED AND IS IN ACCORDANCE WITH U.S. COAST GUARD MINIMUM THICKNESS REQUIREMENTS.
4. THE ORDERED THICKNESS IS BASED ON A MINIMUM BEND RADIUS OF 5 I.P.S. DIAMETERS.
5. VALVES MARKED THUS ON THE FACE OF THE PLAN SHALL BE INSTALLED AS FOLLOWS:

FLUID ON THIS SIDE IS
ISOLATED FROM STEM
PACKING WITH VALVE CLOSED.



FLUID ON THIS SIDE IS
IN CONTACT WITH STEM
PACKING WITH VALVE CLOSED.

6. LETTERS "A," "B," AND ETC. SHOWN ON PIPE RUNS ARE FOR USE WITH FLOW TABLE ON SHEET #13.
7. GAGE PIPING SHALL BE IN ACCORDANCE WITH REFERENCE #12.
8. INSULATION AND LAGGING REQUIREMENTS SHALL BE IN ACCORDANCE WITH REFERENCE #13.
9. EACH FUEL OIL STORAGE TANK IS TO BE FITTED WITH 1700 FEET OF 2 INCH I.P.S. HEATING COILS ARRANGED IN 3 BUNDLES AS SHOWN ON DIAGRAM.
10. EACH FUEL OIL SETTLING TANK IS TO BE FITTED WITH 200 FEET OF 2 INCH I.P.S. HEATING COIL.
11. THE LUBE OIL SETTLING TANK IS TO BE FITTED WITH 450 FEET OF 2 INCH I.P.S. HEATING COIL.
12. THE LUBE OIL SUMP TANK IS TO BE FITTED WITH 70 FT OF 2 INCH HEATING COIL.
13. THE LOW SULPHUR FUEL OIL TK IS TO BE FITTED WITH 400 FEET OF 2 INCH HEATING COIL.
14. ONE OF THE COILS IN EACH FUEL-OIL STORAGE TANK SHALL BE ARRANGED TO CONCENTRATE HEAT AS CLOSE AS PRACTICABLE TO THE FUEL-OIL SUCTION TAIL PIPE.
15. (HULL 613C/614C ONLY) THE CARGO OIL/SLOP TANK (12 PORT) IS TO BE FITTED WITH 6100 FT. OF 2"-90:10 CU-NI HEATING COIL ALONG THE TANK SIDES AND 700 FT OF 1½"-90:10 CU-NI COILS IN THE BOTTOM OF THE TANK.
16. THE CONTAMINATED DRAIN INSP TANK SHALL BE FITTED WITH SIGHT GLASSES FOR READY OBSERVATION OF THE DRAINS; AN ELECTRIC LIGHT TO BE FITTED IN BACK OF REAR GLASS FOR ILLUMINATION OF THE INTERIOR OF THE TANK. THE INSPECTION TANK IS TO BE DIVIDED INTO 2 SECTIONS. A FILTER IS TO BE FITTED BETWEEN THESE SECTIONS. A SCUM DRAIN SHALL BE PROVIDED FOR REMOVAL OF OIL.
17. (613C & 614C) DECK STEAM & EXHAUST MAINS SHALL BE FITTED WITH ¾" LOW POINT DRAIN VALVES TO ALLOW COMPLETE DRAINAGE OF THOSE PORTIONS OF THE SYSTEM SUBJECT TO FREEZING.
18. THE NORMAL WATER LEVEL FOR THE CONTAMINATED STEAM GENERATOR IS 3" ABOVE THE MID POINT OF THE GAGE GLASS. THE MAKE-UP VALVE FOR THE DRAIN INSPECTION TANK (V453) SHOULD ACTUATE WHEN WATER IS BARELY VISIBLE IN THE BOTTOM OF THE GAGE GLASS & SHOULD CLOSE WHEN THE WATER IS 3" ABOVE THE CENTER OF THE GLASS. THE DRAIN VALVE (V458) SHOULD OPEN WHEN WATER IS 7" ABOVE ℄ OF GAGE GLASS AND SHOULD CLOSE WHEN THE WATER IS 3" ABOVE THE CENTER OF THE GLASS. THE WATER LEVEL IN THE DRAIN COOLERS SHOULD BE MAINTAINED AT THE MID POINT OF THE GAGE GLASS.

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-693	REV. E
		SHEET 4

MN 13-11X17 (REV. 1)

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MATERIAL SCHEDULE

SERVICE	ITEM	TYPE	SIZE	MATERIAL	APPLICABLE DOCUMENTS
125# CONTAMINATED STEAM & DRAINS TO FIRST CUT OUT VALVE DOWNSTREAM OF TRAP, AND FEED SUCTION AND DISCHARGE.(H615 ONLY) 220# CONTAMINATED STEAM & DRAINS TO FIRST CUTOUT VALVE DOWNSTREAM OF TRAP OR DECK WINCH, AND FEED SUCTION & DISCHARGE (H613C/614C ONLY)	PIPING	SEAMLESS	ALL	CARBON STEEL	ASTM A53-73 GR-"B"
	FITTINGS	FLANGED	ALL	CAST CARBON STEEL	ANSI B16.5-73, 150#, ASTM A216-70 GR WCB
		WELDED BRANCH	2-1/2" & ABV	CARBON STEEL	———
		BUTT WELDING		FORGED CARBON STEEL	ANSI B16.9-71, ANSI B16.28-64, SCH 40, ASTM A234-73
		SOCKET WELDING	2" & BEL		ANSI B16.11-73, 3000#, ASTM A234-73
	JOINTS	FLANGED SLIP-ON	2-1/2" & ABV	FORGED CARBON STEEL	ANSI B16.5-73, 150#, ASTM A105-71
		UNIONS SOCKET WELD	2" & BEL	FORGED STEEL	ANSI B16.11-73, 3000#, ASTM A234-73
	GASKETS	SHEET	ALL	COMP ASBESTOS	COMMERCIAL 1/16" THK
	FLANGE BOLTING	BOLTS HVY-HEX HEAD	ALL	STEEL	ANSI B1.1-60 (THREADS)
		NUTS - HVY HEX			ANSI B18.2-72 (HEX HEADS)
40# STM, AND ALL DRAINS BEYOND FIRST CUT OUT VALVE DOWNSTREAM OF TRAP	PIPING	SEAMLESS	ALL	CARBON STEEL	ASTM A53-73, GR "B"
	FITTINGS	FLANGED	2" & ABV	CAST CARBON STEEL	ANSI B16.5-73, 150#, ASTM A216-70, GR WCB
		WELDED BRANCH		CARBON STEEL	———
		BUTT WELDING		FORGED CARBON STEEL	ANSI B16.9-71, ANSI B16.28-64, SCH 40, ASTM A234-73
		SOCKET WELDING	1-1/2" & BEL	FORGED CARBON STEEL	ANSI B16.11-73, 3000#, ASTM A234-73
		SCREWED		MALLEABLE IRON	ANSI B16.3-71, 150#, ASTM A197-71
	JOINTS	FLANGED SLIP-ON	2" & ABV	FORGED CARBON STEEL	ANSI B16.5-73, 150#, ASTM A105-71
		UNIONS SCRD	1-1/2" & BEL	MALLEABLE IRON	ANSI B16.3-71, 150#, ASTM A197-71
	GASKETS	SHEET	ALL	COMP ASBESTOS	COMMERCIAL 1/16"
	FLANGE BOLTING	BOLTS-HVY HEX HEAD	ALL	STEEL	ANSI B1.1-60 (THREADS)
		NUTS-HVY HEX			ANSI B18.2-72 (HEX HEADS)
L.O. & F.O. TANK HEATING COILS	PIPING	SEAMLESS	2"	CARBON STEEL	ASTM A53-73, GR "B"
	FITTINGS	SOCKET WELDING	2"	FORGED CARBON STEEL	ANSI B16.11-73, 3000#, ASTM A234-73
SLOP TANK HEATING COILS H613/614 ONLY	PIPING	SEAMLESS	1½" & 2"	90:10 CU-NI	ASME SB466 OR SB 467
	FITTINGS	WELDED	1½" & 2"	CU-NI	ASTM B151 ANSI B16.11

REMARKS

PIPE LIST

SERV	NOM SIZE	CAL MIN THK*	ORDERED THK**	SCHEDULE
125# STEAM	4"	.028"	.237"	STD
	3"	.087"	.216"	
	2-1/2"	.083"	.203"	
	2"	.080"	.154"	
	1-1/2"	.077"	.145"	
	1"	.073"	.133"	
	1/2"	.070"	.147"	X-HEAVY
FEED SUCTION	2-1/2"	.080"	.203"	STD
	2"	.077"	.154"	
	1"	.072"	.133"	
	1/2"	.069"	.147"	X-HEAVY
FEED DISCH	1-1/2"	.081"	.145" H615C ONLY	STD
	1"	.076"	.133"	
	1"	.087"	.153 H613C & H614C ONLY	
	2"	.104"	.154	
	2½"	.112"	.203	
DRAINS & 40PSI STEAM	4"	.023"	.237	STD
	3"	.083"	.216	
	2-1/2"	.080"	.203"	
	2"	.077"	.154"	
	1-1/2"	.075"	.145"	
	1"	.072"	.133"	
	1/2"	.069"	.147"	X-HEAVY
H613C & H614C ONLY 220# CONTAM. STEAM SYS	10"	.111	.365	*** STD
	8"	.089	.322	
	6"	.068	.280	
	5"	.057	.258	
	4"	.046	.237	
	3"	.101	.216	
	2½"	.095	.203	
	2"	.090	.154	
	1½"	.085	.145	
	1"	.079	.133	
	½"	.074	.147	X-HEAVY
HEATING COILS	2"	.077"	.218"	X-HEAVY
HEATING COILS	2"	.114"	.120 MIN	.120 MIN
	1½"	.104"	.112 MIN	.112 MIN.

*** STEAM PIPE ON DECK TO DECK MACHY TO BE X-HVY.

*SEE NOTE #3
**SEE NOTE #4

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI B16.5 CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V375	1	8" △ 4" ⊛	ANGLE ST. CHK	CARBON STEEL	300# △ 150# ⊛	FLG ANSI B16.5	SST	CONTAM. STM. GEN. OUTLET		ASTM A-216 GR WCB
	V376	1	1-1/2"	GLOBE STOP		600#	SW ANSI B16.11		CONTAM. STM. - TO PORT F.O. SETT. TK. HTG. COIL		ASTM A-105
	V377	1	4"			150#	FLG ANSI B16.5		CONTAM. STM. TO PORT F.O. STORAGE TK. HTG. COIL		ASTM A-216 GR WCB
	V378	1	1-1/2"			600#	SW ANSI B16.11		CONTAM. STM. TO STBD. F.O. SETT. TK. HTG. COIL		ASTM A-105
	V379	1	4"			150#	FLG ANSI B16.5		CONTAM. STM. TO STBD. F.O. STORAGE TK. HTG. COIL		ASTM A-216 GR WCB
	V380	1	2"			600#	SW ANSI B16.11		CONTAM. STM. TO LOW SULPHUR F.O. TK. HTG. COIL		ASTM A-105
	V381	1	1/2"	↓				↓	CONTAM. STM. TO BURNER CLN. BENCH		
	V382	1	1"	GL. ST. CHK	↓	↓	↓	MONEL	SEA CHEST STEAM OUT		↓
	V383	1	2"	ANGLE STOP	DUCTILE IRON	150#	FLG'D ANSI B16.5				ASTM-A395 OR A445
	V384	1	2"								
	V385	1	2"								
	V386	1	2"								
	V387	1	2"								
	V388	1	2"								
	V389	1	2"								
	V390	1	2"	↓	↓	↓	↓	↓	↓		↓
	V391	1	1/2"	GLOBE STOP	CARBON STEEL	600#	SW ANSI B16.11	SST	PORT BLR. CASING SMOTHERING		ASTM-A105
	V392	1	1/2"	↓		↓	↓		STBD ↓		↓
H	V393	1	1½"	PRESS RED		150#	FLG ANSI B16.5		CONTAM. STM. RED. V.	220/40. PSIG △ 125/40 PSIG ⊛	ASTM A-216 GR WCB
	V394	1	3"	GLOBE STOP					RED. V. INLET		
	V395	1	3"	GATE					OUT		
	V396	1	3"	GLOBE STOP					↓ BYPASS		
E	V397	1	3"x4" ⊛ 4"x6" △	RELIEF	↓	↓	↓	↓	40# CONTAM. STM. SYS	SET AT 50 PSI	↓

△ H613C & H614C ONLY
⊛ H615C ONLY

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V398	1	3"	GLOBE STOP	CAST IRON	125#	FLG ANSI B16.1	BRONZE	STM. TO HTG. SYS		ASTM A126 CL "B"
	V399	1	1"		BRONZE	250#	SCRD ANSI B16.15		STM. TO INERT GAS WATER SEAL UNIT		ASTM B61 OR B62
	V400	1	1-1/2"	↓ ↓					STM. TO HOT WATER HTR		
H	V401	1	1½	TEMP REG					↓ ↓ ↓ ↓ ↓ REG.V.	SET TO MAINTAIN WATER AT 140°F	
D	V402	1	1-1/2"	GLOBE STOP					STM. TO H.W. HTR REG. V. IN	VENDOR FURNISHED	
D	V403	1	1-1/2"	GATE					OUT		
D	V404	1	1-1/2"	GLOBE STOP					↓ ↓ ↓ ↓ BYPASS	↓ ↓	
	V405	1	1"	↓ ↓					L.O. PURIF. HTR.		
	V406	1	½"	TEMP REG	WITH INTEGRAL STRAINER				REG. V.	TEMP. CONTROL RANGE 130-180°F	
	V407	1	1"	GLOBE STOP					REG. V. IN		
	V408	1	1"	GATE					OUT		
	V409	1	1"	GLOBE STOP	↓	↓	↓		↓ ↓ BYPASS		↓
	V410	1	2-1/2"		CAST IRON	125#	FLG ANSI B16.1		↓ SETT. TK HTG COILS		ASTM A126 CL "B"
	V411	1	1"	↓ ↓	BRONZE	250#	SCRD ANSI B16.15	↓	MN. L.O. SUMP HTG COILS		ASTM B61 OR B62
H	V412	1	1½"	TEMP REG	CARBON STEEL	150#	FLG ANSI B16.5	SST	F.O. HTRS REG V.	TEMP. CONTROL RANGE 200-270°F	ASTM A216 GR WCB
	V413	1	2"	GLOBE STOP		600#ANSI B16.5	S.W. ANSI B16.11		REG. V. IN		ASTM A105
	V414	1	2"	GATE					OUT		
	V415	1	2"	GLOBE STOP					↓ ↓ ↓ BYPASS		
	V416	1	2"						HTR #1		
	V417	1	2"						↓ ↓ ↓ ↓ #2		
	V418	1	1"	↓ ↓					PORT F.O. SET. TK. HTG. COIL DRN		
	V419	1	1"	GATE							
	V420	1	1"	GLOBE STOP	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ ↓ ↓		↓

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V421	1	2-1/2"	GLOBE STOP	CARBON STEEL	150#	FLG ANSI B16.5	SST	PORT F.O. STOR. TK. HTG. COIL.DRN		ASTM A216 GR WCB
	V422	1	2-1/2"	GATE	↓	↓	↓	↓	↓		↓
	V423	1	2-1/2"	GLOBE STOP	↓	↓	↓	↓	↓		↓
	V424	1	1"	↓ ↓	↓	600#ANSI B16.5	S.W. ANSI B16.11	↓	STBD F.O. SET. TK. HTG. COIL DRN		ASTM A105
	V425	1	1"	GATE	↓	↓	↓	↓	↓		↓
	V426	1	1"	GLOBE STOP	↓	↓	↓	↓	↓		↓
	V427	1	2-1/2"	↓ ↓	↓	150#	FLG ANSI B16.5	↓	STBD. F.O. STOR. TK. HTG. COIL DRN		ASTM A216 GR WCB
	V428	1	2-1/2"	GATE	↓	↓	↓	↓	↓		↓
	V429	1	2-1/2"	GLOBE STOP	↓	↓	↓	↓	↓		↓
	V430	1	1-1/2"	↓ ↓	↓	600#ANSI B16.5	S.W. ANSI B16.11	↓	LOW SULPHUR F.O. TK. HTG. COIL DRN		ASTM A105
	V431	1	1-1/2"	GATE	↓	↓	↓	↓	↓		↓
	V432	1	1-1/2"	GLOBE STOP	↓	↓	↓	↓	↓		↓
	V433	1	1/2"	↓ ↓	BRONZE	250#	SCRD ANSI B16.15	BRONZE	INERT GAS WATER SEAL UNIT HTG. COIL DRN		ASTM B61 OR B62
	V434	1	1/2"	GATE	↓	↓	↓	↓	↓		↓
	V435	1	1/2"	GLOBE STOP	↓	↓	↓	↓	↓		↓
	V436	1	1"	↓ ↓	↓	↓	↓	↓	HOT WATER HTR. COIL DRN		↓
	V437	1	1"	GATE	↓	↓	↓	↓	↓		↓
	V438	1	1"	GLOBE STOP	↓	↓	↓	↓	↓		↓
	V439	1	1/2"	↓ ↓	↓	↓	↓	↓	L.O. PURIF. HTR. COIL DRN		↓
	V440	1	1/2"	GATE	↓	↓	↓	↓	↓		↓
	V441	1	1/2"	GLOBE STOP	↓	↓	↓	↓	↓		↓
	V442	1	2"	↓ ↓	↓	↓	↓	↓	L.O. SET. TK. HTG. COIL DRN		↓
	V443	1	2"	GATE	↓	↓	↓	↓	↓		

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V444	1	2"	GLOBE STOP	BRONZE	250#	SCRD ANSI B16.15	BRONZE	L.O. SET. TK. HTG. COIL DRN		ASTM B61 OR B62
	V445	1	1"	↓ ↓	↓	↓	↓	↓	MN. L.O. SUMP HTG. COIL DRN		↓
	V446	1	1"	GATE	↓	↓	↓	↓	↓		↓
	V447	1	1"	GLOBE STOP	↓	↓	↓	↓	↓		↓
	V448	1	1"	↓ ↓	CARBON STEEL	600#ANSI B16.5	S.W. ANSI B16.11	SST	CONTAM. STM. GEN. SURFACE BLOW		ASTM A105
	V449	1	1"	↓ ↓	↓	↓	↓	↓	BOTTOM BLOW		↓
	V450 ⊛	1	2"	GL. ST. CHK	DUCTILE IRON	150#	FLG ANSI B16.5	MONEL	BLOW OVBD		ASTM-A395 OR A445
	V451	1	1"	GLOBE STOP	CARBON STEEL	600#ANSI B16.5	S.W. ANSI B16.11	SST	DRAIN		ASTM A105
E	V452	1	3"x3" ⊛ 4"x6" △	RELIEF	↓	300# △ 150# ⊛	FLGD ANSI B16.5	↓	RELIEF	SET AT 250 PSI △ SET AT 160 PSI ⊛	ASTM A216 GR WCB
H	V453	1	3/4"	LEVEL CONTROL	BRONZE	150#	SCRD ANSI B16.15	↓	MAKE-UP FEED TO CONTAM. DRN. TK.	SEE NOTE #18	ASTM B61 OR B62
	V454	1	1"	GLOBE STOP	CARBON STEEL	600#ANSI B16.5	S.W. ANSI B16.11	↓	↓		ASTM A105
	V455	1	1"	↓ ↓	↓	↓	↓	↓	CONTAM. DR. TK. SCUM DRN. TO BILGE		↓
	V456	1	1"	↓ ↓	↓	↓	↓	↓	DRAIN TO BILGE		↓
	V457	1	1"	↓ ↓	↓	↓	↓	↓	↓		↓
H	V458	1	3/4"	LEVEL CONTROL	BRONZE	150#	SCRD ANSI B16.15	↓	DRN. TO CONDSR	SEE NOTE #18	ASTM B61 OR B62
	V459	1	2"	GLOBE STOP	CARBON STEEL	600#ANSI B16.5	S.W. ANSI B16.11	↓	↓	LOCKED CLOSED	ASTM A105
	V460	1	2"	↓ ↓	↓	↓	↓	↓	MN CONDSR		↓
H	V461	1	2½"	↓ ↓	↓	150#	FLG ANSI B16.5	↓	CONTAM. FD. P. #1 SUCT	FURN W/GEN	ASTM-A216 GR WCB
↓	V462	1	2½"	↓ ↓	↓	150#	↓	↓	#2 SUCT	↓	↓
↓	V463	1	1½"	GL. ST CHK.	↓	600#ANSI B16.5	S.W. ANSI B16.11	↓	#1 DISCH	↓	ASTM A105
↓	V464	1	1½"	↓ ↓ ↓	↓	↓	↓	↓	#2 DISCH	↓	↓
↓	V465	1	1½"	LEVEL CONTROL	BRONZE	150#	SCRD ANSI B16.15	↓	DISCH. CONT. V.	↓	ASTM B61 OR B62
↓	V466	1	2"	GLOBE STOP	CARBON STEEL	600#ANSI B16.5	S.W. ANSI B16.11	↓	CONT. V. IN	↓	ASTM A105

△ H613C & H614C ONLY

⊛ H615C ONLY

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MICRO-MASTER® 105 mm

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
H	V467	1	2"	GLOBE STOP	CARBON STEEL	600#ANSI B16.5	SW ANSI B16.11	SST	CONTAM. FD. P. DISCH CONT. V. OUT	FURN W/GEN	ASTM A105
H	V468	1	2"	↓ ↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ ↓ BYPASS	↓	↓
	V469	1	1"	GL. ST. CHK	↓	↓	↓	↓	↓ ↓ ↓ #1 RECIRC	LOCKED OPEN	↓
	V470	1	1"	↓ ↓ ↓	↓	↓	↓	↓	↓ ↓ ↓ #2 ↓	↓ ↓	↓
	V471	1	1-1/2"	GLOBE STOP	↓	↓	↓	↓	F.O. HTR #1 STM. DRN.		↓
	V472	1	1-1/2"	↓ ↓	↓	↓	↓	↓	↓ ↓ #2 ↓ ↓		↓
	V473	1	1-1/2"	↓ ↓	↓	↓	↓	↓	F.O. HTR STM. DRN.		↓
	V474	1	1-1/2"	GATE	↓	↓	↓	↓	↓ ↓ ↓ ↓		↓
	V475	1	1-1/2"	GLOBE STOP	↓	↓	↓	↓	↓ ↓ ↓ ↓		↓
	V476	1	1/4"	↓ ↓	↓	↓	↓	MONEL	SEA CHEST STEAM OUT - TEST		↓
	V477	1	1/4"	↓ ↓	↓	↓	↓	SST	PORT BLR CASING SMOTHERING - TEST		↓
	V478	1	1/4"	↓ ↓	↓	↓	↓	↓	STBD ↓ ↓ ↓ ↓		↓
	V479	1	2"	↓ ↓	↓	↓	↓	↓	CONTAM. DR.TK..DR TO AUX CONDSR		↓
	V480	1	1"	↓ ↓	↓	↓	↓	↓	DR TK FEED TREATMENT		↓
	V481	1	1/2"	↓ ↓	BRONZE	250#	SCRD ANSI B16.15	↓	LEVEL CONTROL PILOT C.O.		ASTM-B61 OR B62
	V482	1	1/2"	↓ ↓	↓	↓	↓	↓	↓ ↓ ↓ ↓		ASTM A105 ↓
	V483	1	1/2"	↓ ↓	↓	↓	↓	↓	↓ ↓ ↓ ↓		↓
	V484	1	1/2"	↓ ↓	↓	↓	↓	↓	↓ ↓ ↓ ↓		↓
	V485A V485B V485C	3	1/2"	RELIEF VALVE	CARBON STEEL	600# ANSI B16.5	SW ANSI B16.11	↓	CONDENSATE DEOILER		↓
	~~V486~~	~~1~~	~~1/2"~~	GLOBE VALVE	↓	↓	↓	↓	~~↓ ↓ ↓ ↓~~		ASTM-A105
	V487	1	1"	↓ ↓	↓	↓	↓	↓	STM TO INERT GAS WATER SEAL UNIT		↓
	V488	1	1/4"	GLOBE STOP	BRONZE	250#	SCRD ANSI B16.15	BRONZE	SAMP CONN LO PURIF HTR		ASTM B61 OR B62
	V489	1	1/4"	↓ ↓	↓	↓	↓	↓	↓ ↓ HTG COIL LO SET. TK		↓

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V490	1	1/4	GLOBE STOP	BRONZE	250#	SCRD ANSI B16.15	BRONZE	SAMP CONN MN LO SUMP HTG COILS		ASTM B61 OR B62
	V491	1	1/4	↓	CARBON STEEL	600# ANSI B16.5	SW ANSI B16.11	SST	↓ FO HTR #1 ↓		ASTM A105
	V492	1	1/4	↓	↓	↓	↓	↓	↓ FO HTR #2 ↓		↓
	V493	1	1/4	↓	↓	↓	↓	↓	↓ PORT FO SETT TK HTG COILS		↓
	V494	1	1/4	↓	↓	↓	↓	↓	↓ STOR TK ↓		↓
	V495	1	1/4	↓	↓	↓	↓	↓	↓ STBD SETT TK ↓		↓
	V496	1	1/4	↓	↓	↓	↓	↓	↓ STOR TK ↓		↓
	V497	1	1/4	↓	↓	↓	↓	↓	↓ LOW SULFUR FO TK ↓		↓
	V498	1	2	ANGLE STOP	DUCTILE IRON	150#	FLG'D ANSI B16.5	MONEL	SEA CHEST STEAM OUT		ASTM-A395 OR A445
	V499	1	2	↓	↓	↓	↓	↓	↓		↓
	V500	1	2	↓	↓	↓	↓	↓	↓		↓
	V501	1	2	↓	↓	↓	↓	↓	↓		↓
	V502 △	1	5	GATE	CARBON STEEL	↓	↓	SST	STM TO SLOP TANK HTG COILS		ASTM-A216 GR WCB
	V503 △	1	2	GLOBE STOP	↓	600#	SW	SST	STEAM TO F.O. HEATERS		ASTM-A105
	V504 △	1	1½	↓	↓	↓	↓	↓	↓		↓
	V505 △	1	2	GATE	↓	↓	↓	↓	↓		↓
H	V506 △	1	1"	PRESSURE REDUCING	↓	150#	FLG'D	↓	↓	220/125 PSIG	ASTM-A216 GR WCB
D	V507 △	1	1½" x 2½"	RELIEF	↓	150#	↓	↓	↓	SET AT 150 PSIG	↓
.	V508 △	1	2	GLOBE STOP CHK	↓	↓	↓	MONEL	STM GENERATOR BLOW OUTBD		↓
	V509 △	1	10	GATE	↓	↓	↓	BRONZE	EXH FROM AFT DK MACHY		↓
	V510 △	1	8	↓	↓	↓	↓	↓	EXH FROM FWD. DK MACHY		↓
	V511 △	1	10	↓	↓	↓	↓	BRONZE	EXH FROM DECK MACHY		↓
D	V512 △	1	10	↓	↓	↓	↓	↓	↓		↓

△ H613C & H614C ONLY

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
E	V513P △	1	½	GLOBE STOP	CARBON STEEL	600#	SW	SST	DECK MACHY. PIPE WARM-UP, PORT		ASTM-A-105
	V513S △	1							↓ ,STBD		
E	V514 △	1	½	SENTINEL	BRONZE	250#	SCRD	BRONZE	EXH FROM DECK MACHY	SET AT 50 PSI	ASTM-A-61
E	V515 △	1	½	↓	↓	↓	↓	↓	↓	↓	↓
	V516 △	1	½	GLOBE STOP	CARBON STEEL	600#	SW	SST	DECK MACHY PIPE WARM-UP		ASTM-A 105
	V517 △	1	3"	GATE	↓	150#	FLG'D	SST	SLOP TANK HTG COIL #3 DRN		ASTM-A 216 GR WCB
	V518 △	1	4"	↓	↓	↓	↓	↓	SLOP TANK HTG COIL DRN		↓
	V519 △	1	3	GLOBE STOP	↓	↓	↓	↓	↓		↓
	V520 △	1	4	GLOBE STOP CHK	↓	↓	↓	↓	↓		↓
	V521 △	1	1	GLOBE STOP	↓	600#	SW	SST	↓		ASTM-A105
F	V522 △	1	¾"	↓	↓	↓	↓	↓	↓		↓
H	V523 △	1	2"	LEVEL CONTROL	↓	150#	FLG'D	↓	↓		ASTM-A216 GR WCB
	V524 △	1	4	GATE	↓	↓	↓	BRONZE	↓		ASTM-A216 GR WCB
	V525 △	1	½	GLOBE STOP	↓	600#	SW	SST	LEVEL CONTROL SENSING		ASTM-A105
	V526 △	1	½	↓	↓	↓	↓	↓	↓		↓
	V527 △	1	½	↓	↓	↓	↓	↓	RESERVOIR FILL		↓
	V528	1	¼	GLOBE STOP	BRONZE	250#	SCRD ANSI B16.15	BRONZE	SAMP CONN INERT GAS WATER SEAL UNIT		ASTM-B61 OR B62
H	V529 △	1	2½"	↓	CARBON STL	150#	FLG'D ANSI B16.5	SST	CONTAM GEN FD PUMP #3 SUCT	FURN W/ GEN	ASTM-A216 GR WCB
H	V530 △	1	1½"	GLOBE ST. CHK	↓	600# B16.5	SW ANSI B16.11	↓	↓ DISCH	↓	ASTM-A105
H	V531 △	1	1"	↓	↓	↓	↓	↓	↓ RECIRC	↓	↓
C	V532 △	1	2"	GATE	↓	150#	FLG'D	SST	STRIP PUMP EXH OIL SEP DRAIN TRAP INLET		ASTM-A 216 GR WCB
F	V533 △	1	2"	↓	↓	↓	↓	↓	STRIP PUMP EXH OIL SEP DRAIN TRAP OUTLET		↓
C	V534 △	1	2"	↓	↓	↓	↓	↓	DECK EXH OIL SEP DRN TRAP IN		ASTM-A 216 GR WCB
F	V535 △	1	2"	↓	↓	↓	↓	↓	↓ TRAP OUT		↓

△ H613C & H614C ONLY

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		SHEET 11A

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V166 △	1	5	GATE	CARBON STEEL	B16.5 150 #	FLG'D ANSI B16.5	SST	AUX ST TO DECK MACHY AFT		ASTM-A216 GR WCB
	V167 △	1	8						AUX ST TO DECK MACHY FWD		
	V179 △	1	4						DECK WINCH STEAM CUT-OUT		
	V180 △	1	4								
	V181 △	1	4								
	V182 △	1	4								
	V183 △	1	4								
	V184 △	1	4								
	V185 △	1	4								
	V186 △	1	4								
	~~V187~~	~~1~~	~~4~~						~~SHORE CONN ON UPPER DK~~		
	V188 △	1	4						COMB WINCH & WINDLASS ST CUT-OUT		
	V189 △	1	4								
	V190 △	1	4						DECK WINCH STEAM CUT-OUT		
	V291 △	1	5			B16.5 150#	FLG'D ANSI B16.5	BRONZE	DECK WINCH EXHAUST		
	V292 △	1	5								
	V293 △	1	5								
	V294 △	1	5								
	V295 △	1	5								
	V296 △	1	5								
	V297 △	1	5								
	V298 △	1	5								
D	~~V299 △~~	~~1~~	~~5~~								

△ H613C & H614C ONLY

HULL NO.	DWG NO.	REV.
613C, 614C, 615C	6450-693	E
		SHEET 11B

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V300 △	1	5"	GATE	CARBON STEEL	B16.5 150 #	FLG'D ANSI B16.5	BRONZE	DECK WINCH EXHAUST		ASTM A216 GR WCB
	V301 △	1	5"								
	V302 △	1	5	↓		↓	↓	↓	↓		
F	V536 △	1	2"	GLOBE STOP		150#	FLG'D	SST	DECK EXHAUST & STRIP PUMP OIL SEPARATOR DRAIN		↓
	V537 △	1	¼"			600#	SW		DECK EXHAUST TEST CONN		ASTM-A105
	V538 △	1	¼"	↓		↓	↓	↓	SLOP TK HTG COIL #3 DRN TEST CONN		↓
	V539 △	1	3"	GLOBE ST CHK		B16.5 150#	FLG'D	BRONZE	#3 TRAP IN		ASTM-A 216 GR WCB
	V540 △	1	3"			↓	↓	↓	#3 ↓ BYPASS		↓
	V541 △	1	2"			600#	SW	SST	#4		ASTM-A105
	V542 △	1	2"	↓					#4		
	V543 △	1	2"	GATE					#4		
	V544 △	1	¼"	GLOBE STOP					#4 ↓		
	V545 △	1	1"						STEAM FOR PORTABLE GAS FREEING BLOWERS		
	V546 △	1	1"								
	V547 △	1	1"								
	V548 △	1	1"								
	V549 △	1	1"								
	V550 △	1	1"								
	V551 △	1	1"								
	V552 △	1	1"								
	V553 △	1	1"								
	V554 △	1	1"								
	V5000 △	1	1"	↓	↓	↓	↓	↓	↓		↓

△ H613C & H614C ONLY

HULL NO. 613C, 614C, 615C	DWG NO. 6450-693	REV. F
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VALVE LIST

REV	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANS PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V5001 △	1	1"	GLOBE STOP	CARBON STEEL	600#	SW	SST	STEAM FOR PORTABLE GAS FREEING BLOWER		ASTM-A105
	V5002 △	1	2"	↓	↓	600#	SW	↓	STM TO SLOP TANK HTG COIL #4		↓
	V5003 △	1	3"	↓	↓	B16.5 150#	FLG'D	↓	↓ #1	✓	ASTM-A216 GR WCB
D	V5004	1	2"	ANGLE STOP	DUCTILE IRON	150#	FLG'D ANSI B16.5	MONEL	SEA CHEST STEAM OUT PUMP RM		ASTM-A395 OR A445
↓	V5005	1	2"	↓	↓	↓	↓	↓	↓ ↓		↓
↓	V5006	1	2"	↓	↓	↓	↓	↓	↓ ↓		↓
↓	V5007	1	1"	GLOBE STOP	CARBON STL	600#	SW	SST	ST TO SEA CHEST PUMP RM BHD CO		ASTM-A105
↓	V5008	1	1	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ EMER P. RM BHD CO		↓
↓	V5009	1	½"	↓	↓	↓	↓	↓	SENSING FOR V393		↓
↓	V5010 △	1	½"	↓	↓	↓	↓	↓	↓ V506		↓
F	V5011	1	2"	GLOBE STOP	↓	150#	FLG'D	↓	DK EXH SEP. TRAP BYPASS		ASTM-A216 GR WCB
↓	V5012	1	2"	GLOBE STOP	↓	↓	↓	↓	STRIP P. ↓ ↓		↓
D	V5013	1	1½"	GLOBE STOP	BRONZE	250#	SCRW'D ANSI B16.15	BRONZE	STM TO STEERING GEAR RM		ASTM B61 OR B62
↓	V5014	1	¾"	↓	↓	↓	↓	↓	↓ EDGR		↓
↓	V5015	1	½"	↓	↓	↓	↓	↓	↓ DK MAINTANCE SHOP		↓
↓	V5016	1	2"	↓	CAST IRON	125#	FLG'D ANSI B16.1	↓	↓ AFT SERVICES C.O.		ASTM A126 CL "B"
E	V5017	1	½"	↓	CARBON STL	600#	SW	SST	LOW POINT DR STM TO PORT FO STG TK - TRAP IN		ASTM-A105
↓	V5018	1	½"	↓	↓	↓	↓	↓	↓ ↓ - TRAP OUT	✓	↓
↓	V5019	1	½"	↓	↓	↓	↓	↓	↓ ↓ - BY-PASS	✓	↓
↓	V5020	1	½"	↓	↓	↓	↓	↓	LOW POINT DR ST TO FO HTR - TRAP IN.	✓	↓
↓	V5021	1	½"	↓	↓	↓	↓	↓	↓ ↓ - TRAP OUT	✓	↓
↓	V5022	1	½"	↓	↓	↓	↓	↓	↓ ↓ - BY-PASS	✓	↓
↓	V5023	1	½"	↓	↓	↓	↓	↓	LOW POINT DR ST STBD FO STG TK - TRAPIN.	✓	↓

△ H613C & H614C ONLY

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-693
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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANS PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
E	V5024	1	½"	GLOBE STOP	CARBON STL	600#	SW ANSI B16.11	SST	LOW POINT DR ST STBD FO STG TK - OUT.		ASTM-A105
↓	V5025	1	½"	↓	↓	↓	↓	↓	↓ - BY-PASS		↓
D	V5026	1	½"	↓	↓	↓	↓	↓	CONTAM ST GEN OUTLET LOW POINT DR - TRAP IN		↓
↓	V5027	1	½"	↓	↓	↓	↓	↓	↓ - TRAP OUT		↓
↓	V5028	1	½"	↓	↓	↓	↓	↓	↓ - BY-PASS		↓
↓	V5029	1	½"	↓	↓	250#	SCR'D ANSI B16.25	BRONZE	SERVICE STM LOW POINT DRAIN - TRAP IN		↓
↓	V5030	1	½"	↓	↓	↓	↓	↓	↓ - TRAP OUT		↓
↓	V5031	1	½"	↓	↓	↓	↓	↓	↓ - BY-PASS		↓
↓	V5032	1	½"	GLOBE STOP CHK	↓	600#	SW ANSI B16.11	SST	SEWAGE TK HOLDING STM OUT.		ASTM-A105
	V5033	1	¼"	↓	BRONZE	250#	SCRD ANSI B16.25	BRONZE	STEAM TO BILGE & BALLAST OIL DETECTORS		ASTM B61 OR B62
	V5034	1	↓	SOLENOID VALVE	↓	↓	↓	↓	STEAM TO BILGE WATER OIL DETECTOR		↓
	V5035	1	↓	↓	↓	↓	↓	↓	↓ ↓ BALLAST WATER OIL DETECTOR		↓
	V5036 △	1	↓	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ ↓		↓
	V5037 △	1	3"	GLOBE STOP	CARBON STL	150#	B16-5	SST	STM. TO SLOP TK. HTG COIL #2		ASTM-A216 GR. WCB
	V5038 △	1	3"	GLOBE STOP	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ #3		↓
	V5039 △	1	3"	GLOBE STOP CHK	↓	↓	↓	↓	DRN. FROM SLOP TK HTG COIL #1		↓
	V5040 △	1	3"	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ #1		↓
	V5041 △	1	3"	GATE	↓	↓	↓	↓	↓ ↓ ↓ ↓ #1		↓
	V5042 △	1	3"	GLOBE STOP CHK	↓	↓	↓	↓	↓ ↓ ↓ ↓ #2		↓
	V5043 △	1	3"	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ #2		↓
	V5044 △	1	3"	GATE	↓	↓	↓	↓	↓ ↓ ↓ ↓ #2		↓
	V5045 △	1	¼"	GLOBE STOP	↓	600#	SW ANSI B16-11	↓	↓ ↓ ↓ ↓ #2		ASTM-A105
	V5046 △	1	¼"	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ #1		↓

△ H613C & H614C ONLY

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-693	
	REV E	SHEET 11E OF

K&E 19 1253 11-72 2491A•

MN13-11X17

6450-693

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4X

VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANS PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V-5047 △	1	2"	GLOBE STOP	CARBON STEEL	600#	S-W-ANSI B16.11	SST	STM TO SLOP TK HTG COIL #1A		ASTM-A105
	V-5048 △	1	↓	↓	↓	↓	↓	↓	↓ #1B		↓
	V-5049 △	1	↓	↓	↓	↓	↓	↓	↓ #2A		↓
	V-5050 △	1	↓	↓	↓	↓	↓	↓	↓ #2B		↓
	V-5051 △	1	↓	↓	↓	↓	↓	↓	↓ #3A		↓
	V-5052 △	1	↓	↓	↓	↓	↓	↓	↓ #3B		↓
	V-5053 △	1	½"	↓	↓	↓	↓	↓	DECK STEAM WARM UP		↓
E	V-5054 △	1	↓	↓	↓	↓	↓	↓	↓ DRN		↓
↓	V-5055 △	1	↓	↓	↓	↓	↓	↓	↓ ↓		↓
↓	V-5056 △	1	4	GATE	↓	B16.5 150#	FLG'D ANSI B16.5	-	COMB WINCH & WINDLASS ST CUT-OUT		ASTM-A216 GR WCB
↓	V.5057 △	1	4	↓	↓	↓	↓	↓	↓ ↓ ↓		↓
↓	V.5058 △	1	5	↓	↓	↓	↓	BRONZE	↓ ↓ EXH		↓
↓	V-5059 △	1	5	↓	↓	↓	↓	↓	↓ ↓ ↓		↓
	V-5061 △	1	½"	GLOBE STOP	CARBON STEEL	600#	S.W. ANSI B16.11	SST	STM TO SLOP TANK HTG COIL-LOW POINT DRAINS		ASTM-A105
	V-5062 △	1	¼"	SOLENOID V	BRONZE	250	SCRD	BRONZE	STM TO BALLAST WATER OIL DETECT		B61 OR =
	V-5063	1	↓	GLOBE STOP	↓	↓	↓	↓	BILGE		↓
	V-5064	1	↓	↓	↓	↓	↓	↓	BALLAST		↓
	V-5065 △	1	↓	↓	↓	↓	↓	↓	↓		↓
	V-5066 △	1	↓	↓	↓	↓	↓	↓	↓		↓
	V-5067	1	↓	↓	↓	↓	↓	↓	TK.CLN.		↓
	V-5068	1	↓	SOLENOID VALVE	↓	↓	↓	↓	↓		↓
E	V-5069	1	4"	GATE	CARBON STL	B16.5 150#	FLGD ANSI B16.5	SST	SHORE CONN ON UPPER DK		ASTM A-216 GR WCB

△ H613C & 614C ONLY

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-693
REV. E	SHEET 11F OF

K&E 19 1253 11-72 2491A*

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANS PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
F	V522A △	1	3/4"	GLOBE STOP	CARBON STL	600#	SW	SST	SLOP TK HTG COIL DRN		ASTM-A105
F	V522B △	1	3/4"	↓	↓	↓	↓	↓	↓		↓
F	V522C △	1	3/4"	↓	↓	↓	↓	↓	↓		↓
F	V5070 △	1	2"	SWING CHECK	CARBON STL	150#	FLG'D	SST	DECK EXH. OIL SEP. DRN.		ASTM-A216 GR WCB
F	V5071 △	1	2"	↓	↓	↓	↓	↓	STRIP. PUMP EXH. OIL SEP. DRN		↓
G	V5072	1	1/2"	GLOBE STOP	↓	600#	SW	↓	HEATING STM SENSING CONN ROOT VLV		ASTM-A105
G	V5073	1	1/2"	↓	↓	↓	↓	↓	OILY WTR SEPERATOR STM		↓
G	V5074	1	1½"	↓	↓	↓	↓	↓	↓		↓
J	V5075	1	1/4"	↓	↓	↓	↓	↓	DRAIN FROM WATER/OIL SENSOR		
J	V5076	1	1/4"	↓	↓	↓	↓	↓	↓		
J	V5077	1	1/4"	↓	↓	↓	↓	↓	↓		
J	V5078	1	1/4"	↓	↓	↓	↓	↓	↓		
J	V5079	1	1/4"	↓	↓	↓	↓	↓	↓		
J	V5080	1	1/4"	↓	↓	↓	↓	↓	↓		
J	V5081	1	1/4"	↓	↓	↓	↓	↓	↓		

△ H613C & H614C ONLY

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-693	
	REV J	SHEET 11G OF

MN13-11X17

K&E 19 1253 11-72 2491A+

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INSTRUMENT LIST

INST Nº	SERVICE	SIZE	RANGE PSI
G-75	CONTAM ST GEN FD PUMP #1 DISCH	4-1/2"	0-400
G-76	CONTAM ST GEN FD PUMP #2 DISCH	4-1/2"	0-400
G-77	CONTAM ST GEN SHELL	4-1/2"	0-300
G-78	CONTAM ST MAIN	4-1/2"	0-300
G-79*	CONTAM ST MAIN	-	0-300
G-80	CONTAM ST 40# RED STA OUTLET	4-1/2"	0-100
G-81 △	CONTAM ST GEN FD PMP #3 DISCH	↓	0-400
G-82 △	STEAM TO F.O. HEATERS	↓	0-200
G-83	EXH FROM DK MACHY	4½"	0-300 Ⓗ

INST Nº	SERVICE	RANGE °F
T-40	CONTAM DR INSPECTION TK	50°-400°
T-41	STM EMERY SUPPY TO CONT STM SYS	0-500° *
T-42	STM SUPPLY TEMP TO SLOP TK HTG COIL	↓ *
~~T-43~~	~~STM TO DECK MACHY TEMP~~	~~0-600°~~ *

INST Nº	SERVICE	RANGE

*LOCATED IN E.O.S.

△ H613C & H614C ONLY

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-693	
	REV. H	SHEET 12 OF —

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PUMP DATA TABLE

	QTY	SERVICE	TYPE	CAP GPM	TOTAL HEAD	SHUTOFF HEAD
H615C ONLY	2	CONTAM STEAM GENERATOR FEED	CENTRIFUGAL	30	185 PSI	—
H613C AND H614C ONLY	3	↓	↓	50	300PSI	—

FLOW DATA TABLE

	SYM	SIZE INCHES	FLOW LB/HR	VEL FT/SEC	CONDITION	SERVICE
H613C & H614C ONLY	A	8	45,000	71	CONTAM STEAM GEN RATING	220 PSI CONTAM STEAM MAIN
H615C ONLY		4	13,500	137		125 PSI CONTAM STEAM MAIN
H613C & H614C ONLY	B	1½	715	25	RATING	SUPPLY TO F.O. SETTLING TANK
H615C ONLY		1½	720	48		
H613C & H614C ONLY	C	4	7,660	47	RATING	SUPPLY TO F.O. STORAGE TANK
H615C ONLY		4	7,720	82		
H613C & H614C ONLY	D	2	1,490	35	RATING	SUPPLY TO LOW SULFUR F.O. TANK
H615C ONLY		2	1,500	60		
H613C & H614C ONLY	E	2	1,390	34	ABS POWER	SUPPLY TO F.O. HEATER
H615C ONLY		2	1,400	56		
	F	1	100	38	RATING	SUPPLY TO INERT GAS WATER SEAL
	G	1-1/2	420	69	RATING	SUPPLY TO HOT WATER HEATER
	H	1	100	38	RATING	SUPPLY TO L.O. PURIFIER HEATER
	I	2-1/2	1,000	70	RATING	SUPPLY TO L.O. SETTLING TANK
	J	1	200	78	RATING	SUPPLY TO MAIN L.O. SUMP
	K	3	2,800	128	RATING	SUPPLY TO SHIP'S HEATING SYSTEM
H613C & H614C ONLY	L	3	50GPM	2.2	PUMP RATING	GENERATOR FEED PUMP SUCTION
H615C ONLY		2½	30GPM	2.0		
H613C & H614C ONLY	M	2	50GPM	4.8	PUMP RATING	GENERATOR FEED PUMP DISCHARGE
H615C ONLY		1½	30GPM	4.7		
H613C AND H614C ONLY	N	5	32,000	127	TANK ⅓ FULL	SUPPLY TO SLOP TANK HEATING
	P	8	34,200	55	TWO WINCHES AT FULL LOAD ONE WINCH AT LIGHT LINE SPEED	SUPPLY TO DECK MACHY FWD

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-693	REV. B
		SHEET 13

MN 13-11X17 (REV. 1)

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DESIGN CHARACTERISTICS (H615C ONLY)

SERVICE	WORKING PRESS	WORKING TEMP.	DESIGN PRESS	DESIGN TEMP	HYDRO TEST PRESSURE
CONT ST GEN OUTLET TO FIRST CUTOUT VALVE, SURFACE & BOTTOM BLOW	125 PSIG	353°F	160 PSIG	370°F	240 PSIG
125 PSI CONTAM ST SYS TO FIRST CUTOUT VALVE DOWNSTREAM OF TRAP	125 PSIG	353°F	150 PSIG	380°F	225 PSIG
40 PSI CONTAM ST TO FIRST CUTOUT VALVE DOWNSTREAM OF TRAP	40 PSIG	320°F	50 PSIG	350°F	75 PSIG
CONTAM ST DRAINS	—	—	—	—	SERVICE
CONTAM ST GEN FEED PUMP DISCHARGE	154 PSIG	200°F	200 PSIG	212°F	300 PSIG
CONTAM ST GEN FEED PUMP SUCTION	—	200°F	—	212°F	SERVICE

DESIGN CHARACTERISTICS (H613C & H614C ONLY)

SERVICE	WORKING PRESS	WORKING TEMP.	DESIGN PRESS	DESIGN TEMP	HYDRO TEST PRESSURE
CONT ST GEN OUTLET TO FIRST CUTOUT VALVE, SURFACE & BOTTOM BLOW	220PSIG	396°F	250PSIG	410°F	375PSIG
220 PSI CONTAM ST SYS TO LAST CUTOUT VALVE DOWNSTREAM OF TRAP EXCEPT STOP TK HTG COIL DRN	220PSIG	396°F	245 PSIG	400°F	368 PSIG
40 PSI CONTAM ST TO FIRST CUTOUT VALVE DOWNSTREAM OF TRAP	40PSIG	335°F	50PSIG	340°F	75PSIG
CONTAM ST DRAINS BEYOND LAST CUT-OUT VALVE	—	—	—	—	SERVICE
CONTAM ST GEN FEED PUMP DISCHARGE	300PSIG	200°F	310 PSIG	212°F	465 PSIG
CONTAM ST GEN FEED PUMP SUCTION	—	200°F	—	212°F	SERVICE
STEAM SUPPLY TO DECK MACHINERY	220PSIG	396°F	245 PSIG	400° F	368 PSIG
Ⓔ DECK MACHY EXHAUST	30 PSIG	280°F	245PSIG	400 °F	368 PSIG
125PSI CONTAM ST SYS TO FIRST CUTOUT VLV DOWNSTREAM OF TRAP	125PSIG	353°F	150PSIG	380°F	225PSIG
SLOP TK HTR COIL DRAIN TO V524 & V519	220PSIG	396°F	245PSIG	400°F	386PSIG
BETWEEN V524 & V520	25PSIG	200°F	75PSIG	200°F	75PSIG

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-693	REV. H
		SHEET 14

MN 13-11X17 (REV. 1)

6450-693

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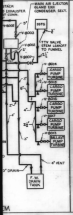
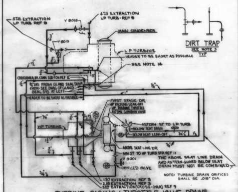
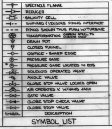
4X


STACK
EXHAUSTER
ST CONN.
MAIN AIR EJECTOR
GLAND EXH
CONDENSER SECT.
V-8005
3"
V-8003
SSTG
3/4"
V-8002
2"
TTV VALVE
STEM LEAKOFF
TO FUNNEL
V-8007
2 1/2"
V-8014
CARGO PUMP TURBINE
3"
6"
2 1/2"
V-8015
CARGO PUMP TURBINE
V-8016
CARGO PUMP TURBINE
2"
4"
2 1/2"
V-8017
CARGO PUMP TURBINE
V-8013
BALLAST PUMP TURBINE
3"
4" VENT
3" DRAIN
F.W. DRAIN TANK
EM


5TH EXTRACTION
LP TURB REF 9
V 8018
4TH EXTRACTION
LP TURB - REF 9
MAIN CONDENSER
3/4"
V-8019
L P TURBINE
HEADER TO BE SHORT AS POSSIBLE
SEE NOTE 14
1 1/2"
3/4"
3"
CROSSOVER DR CONN SSD-7 ON REF 12
3/4" DRS FROM GLAND SEAL DUMP
CHDR - SEE DIAG OF GLAND
SEAL SYS AT LEFT
HEADER TO BE SHORT AS POSSIBLE
3/4"
1"
FIRST STAGE DR
HP PACKING LEAK-OFF
HP TURBINE THROTTLE
ASTERN GUARDIAN VALVE
HP TURBINE
ASTERN ST TO LP TURB
BELOW SEAT DRAIN
BELOW SEAT LEAK-OFF
1 1/2"
ABOVE SEAT LINE DR
MN ST TO HP TURB STR REF 11
V 8001
ORIFICED VALVE
THE ABOVE SEAT LINE DRAIN
AND ASTERN GUARD BELOW SEAT
DRAIN MUST NOT BE COMBINED
NOTE: TURBINE DRAIN ORIFICES
SHALL BE .018" DIA.
1ST EXTRACTION REF 3
2ND EXTRACTION REF 3
3RD EXTRACTION (CROSS-OVER) REF 9
DIRT TRAP
SEE NOTE 3
TYP

TURBINE CASING & THROTTLE VALVE DRAINS



SYMBOL	DESCRIPTION
	SPECTACLE FLANGE
	REDUCER
	SALINITY CELL
	SHIPYARD & VENDORS PIPING INTERFACE
	PIPING SHOWN THUS FURN W/TURBINE
	TRANSFORMATION CARBON STEEL TO CHROME MOLY
	DRAIN POT
	CLOSED FUNNEL
	ORIFICE - SHARP EDGE
	PRESSURE GAGE
*	PRESSURE GAGE LOCATED IN EOS
	SOLENOID OPERATED VALVE
	ANGLE VALVE
	GLOBE STOP VALVE LOCKED OPEN
	AIR OPERATED V. W/HAND JACK
	GATE VALVE
	GLOBE STOP CHECK VALVE
	GLOBE STOP VALVE

SYMBOL LIST

DIAGRAM
GLAND SEALING LEAK-OFF & TURB DR PIPING
ARR

1

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH	OWNER DATE	OWNER APPD
A	-	INITIAL ISSUE	11/11/75	HY	—	—
B	-	IN GLAND LEAKOFF DIAGRAM: SIZE OF CARGO PUMP TURBINE & BALLAST PUMP TURBINE LEADS ALTERED. FW DRAIN TANK & RELATED PIPING ADDED. FIRE PUMP & PIPING DELETED. MAIN TURBINE LEADS RERUN & SIZES ALTERED. DFT VENT MODIFIED TO INCLUDE VALVES & ORIFICE. PIPE RUNS MODIFIED & DRAINS ADDED TO SUIT SHIPS ARRANGEMENT. IN TURBINE DRAIN DIAGRAM: DELETED: 4TH EXTACTION & 5TH EXTRACTION, TURBINE SIDE DRAINS & REQUIREMENT FOR DIRT TRAPS. VALVES RENUMBERED TO AVOID DUPLICATION.	10/25/77	HY	-	-
C	-	ADDED TYP SKETCH & G-11 TO TURBINE CASING & THROTTLE VALVE DRAINS DIAGRAM. DELETED STRAINER FROM GL SEAL REG IN GLAND SEALING SYS DIAGRAM LAM	12/14/77	HY	-	-
D		DELETED G-11 (SHOWN ON REF 11) ALT'D ALL VLV NOS. FROM V-6001 THRU V-6021 TO V-8001 THRU V-8021 RESPECTIVELY GER	10/5/78	HY	-	-
E	-	TURBINE CASING & THROTTLE VALVE DRAINS: ALT'D 3/4" 3RD EXTRACTION STM DRAIN.	3/28/79	HY		

AUTHORITY:

GENERAL NOTES:

D

FOR LIST OF MAT'L NOTES & REF
SEE NN DWG 6450-699

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
G15C	311	
G14C	310	
G13C	309	

APPROVALS

OWNERS	ABS NOT REQ'D
	USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689

SCALE NONE = 1 FT
DRAWN M.D. STAIR
CHECKED H.M. EDGE
SECT MGR J.R. Johnson
DATE COMPL. 10-30-75
EXAMINED E.E. Stephenson
AUTHORIZED E.E.S.
DATE 11-13-75
TECH APPROVAL HNS SAW 11/13/75 11-13-75
CSD APPROVAL EES for R.L. HARRINGTON

DIAGRAM
GLAND SEALING LEAK-OFF & TURB DR PIPING
ARR

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO.
DWG NO. 6450-698
REV E
SHEET NO. 1 OF 1

NO.	REFERENCES	DWG NO.

1

C

B

A

DWG. REV. — HULL APPLIC.

REV	NN HULLS ONLY					
A	YES	YES	YES			
B	YES	YES	YES			
C	YES	YES	YES			
D	YES	YES	YES			
E	YES	YES	NO			

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 3-28-9 SIGNED J.R. Johnson

YARD PRINTS

ORDERED BY DESIGN

GROUP:
MC NO.

6450 - 698

MICRO-MASTER 105 mm
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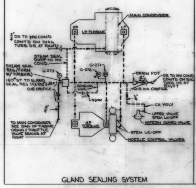
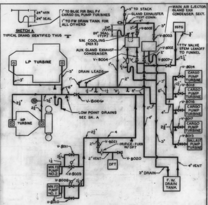
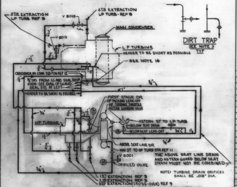
SEPT. '80
10X
FRAME 1


MAIN CONDENSER
HP
LP
LP TURBINE
3/4" DR TO MN COND CONT'D ON DIAG TURB DR AT RIGHT
STEAM SEAL DUMP TO MN COND.
STEAM SEAL REG (FURN W/ TURBINE)
G-273
G-272
G-271
150# ST TO GLAND SEAL REG SEE REF 3
0.18" ORIFICE
SENSING LINE
V8012
DRAIN POT
3/4"
DR TO MN COND CONT'D ON DIAG TURB DR AT RIGHT
0.18 DIA ORIFICE
CR MOLY
UPPER VALVE STEM LK-OFF
ASTERN GUARD VALVE
HP TURBINE
STEM LK-OFF
NOZZLE CONTROL VALVES
TO MAIN CONDENSER SEE DIAG OF TURBINE CASING & THROTTLE VALVE DRAINS AT RIGHT

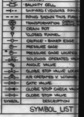
GLAND SEALING SYSTEM


24" MIN
24" SEAL
1" TO BILGE FOR BALL P & CARGO OIL PUMP TURBINES
1" TO FW DRAIN TANK FOR ALL OTHERS
SKETCH A
TYPICAL DRAINS IDENTIFIED THUS
5" TO STACK
GLAND EXHAUSTER
TEST CONN.
4"
3"
V-8005
24" (TYP)
24" SEAL (TYP)
S.W. COOLING (REF 5)
AUX GLAND EXHAUST CONDENSER
V-8004
MAIN AIR EJECTOR GLAND EXH CONDENSER SECT.
V-8003
V-8002
V-8007
SSTG
TTV VALVE STEM LEAKOFF TO FUNNEL
LP TURBINE
DRAIN LEADS
V-8006
LOW POINT DRAINS SEE SK. A
HP TURBINE
V-8014
V-8015
V-8016
V-8017
V-8013
CARGO PUMP TURBINE
BALLAST PUMP TURBINE
V-8021
ORIFICE - FURN W/ DFT
2" VENT
DFT
V-8020
V-8011
V-8009
V-8008
V-8010
MN. FD PUMP NO. 2
MN. FD PUMP NO. 1
3" DRAIN
4" VENT
F. W. DRAIN TANK

GLAND LEAK-OFF SYSTEM


5TH EXTRACTION LP TURB REF 9
4TH EXTRACTION LP TURB - REF 9
V 8018
V-8019
MAIN CONDENSER
L P TURBINE
HEADER TO BE SHORT AS POSSIBLE
SEE NOTE 14
CROSSOVER DR CONN SSD-7ON REF 12
3/4" DRS FROM GLAND SEAL DUMP & HDR - SEE DIAG OF GLAND SEAL SYS AT LEFT
HEADER TO BE SHORT AS POSSIBLE
FIRST STAGE DR
HP PACKING LEAK-OFF
HP TURBINE THROTTLE
ASTERN GUARDIAN VALVE
ASTERN ST TO LP TURB
BELOW SEAT DRAIN
BELOW SEAT LEAK-OFF
HP TURBINE
ABOVE SEAT LINE DR
MN ST TO HP TURB STR REF 11
V 8001
ORIFICED VALVE
THE ABOVE SEAT LINE DRAIN AND ASTERN GUARD BELOW SEAT DRAIN MUST NOT BE COMBINED
NOTE: TURBINE DRAIN ORIFICES SHALL BE .018" DIA.
1ST EXTRACTION REF 3
2ND EXTRACTION REF 3
3RD EXTRACTION (CROSS-OVER) REF 9
DIRT TRAP
SEE NOTE 3
TYP

TURBINE CASING & THROTTLE VALVE DRAINS



—┼—	SPECTACLE FLANGE
—▷—	REDUCER
	SALINITY CELL
—┤- -	SHIPYARD & VENDORS PIPING
- - -	PIPING SHOWN THUS FURN
	TRANSFORMATION CARBON ST CHROME M
	DRAIN POT
	CLOSED FUNNEL
—‖—	ORIFICE - SHARP EDGE
Ⓟ—	PRESSURE GAGE
*Ⓟ—	PRESSURE GAGE LOCATED
	SOLENOID OPERATED VALV
	ANGLE VALVE
	GLOBE STOP VALVE LOCK
	AIR OPERATED V. W/HAND
	GATE VALVE
	GLOBE STOP CHECK VALV
—▷◁—	GLOBE STOP VALVE
SYMBOL	DESCRIPTION

SYMBOL LIST

6450-698

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FRAME 2

10X

6450-699

CSD [redacted] VAULT X182

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APP'D.
—	—	SEE SHEET 2	—	—	—	—

REV. STATUS OF SHEETS								
REV.	D	D	A	C	C	D	D	C
SHEET	1	2	3	4	5	6	7	8

FOR ARR SEE NN DWG 6450-698

GROUP

MC NO.

DWG. REV. — HULL APPLIC.

REV.	NN HULLS ONLY 613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	NO

NNS & DD Co. HULL NO.	MARAD HULL NO.	USMA DESIGN	SHIP'S NAME
615C 614C 613C	311 310 309	T11-S-116a	

APPROVALS

OWNERS

ABS NOT REQ'D

USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
TENNECO
FSCM NO. 43689

Commercial Ship Division

COMMERCIAL SHIP DESIGN DEPARTMENT

SCALE: NONE = 1 Ft.
DRAWN: M D STAIR & W.A. STARKEY
CHECKED: H.M. EDGE
SECT. MGR. J H Johnson

DATE COMPL. 10-30-75
EXAMINED: E E Stephenson
AUTHORIZED:
DATE 11-13-75

TECH. APPROVAL HVS SAW 11/12/75 VRS 11-12-75

CSD APPROVAL EES for R.L. HARRINGTON

TITLE
DIAGRAM
GLAND SEALING LEAK-OFF & TURB DR PIPING
LIST

DWG. NO. 6450-699
REVISION D
SHEET NO. 1 OF 8

M7 11 X 17

DATES: GROUPED CHK. / BY / COMP. / PART

HULL ___ KEY / GROUP NO.

TYPE OF DWG.

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING UO
REMARKS
DATE 12-7-8 SIGNED J H Johnson

REV.	DATE ISSUED
	11-19-75
B	11-1-77
C	1-2-78
D	12-14-78

SPECIAL PRINTS

YARD PRINTS

FIRST ISSUE	DEPT.	NO. PRINTS
	AH	
	BL	
	BR	
	EL	
	FP	
11-1-77	MI	4
	ML	
	MS	
12-14-78	PC	1
	PM	
11-1-77	PS	12
	PN	
	RD	
	RM	
	MIR	
	SH	
	SM	
	TM	
	WD	
	WE	
	WM	
	X16	

ORDERED BY DESIGN

FIRST ISSUE	DEPT.	NO. PRINTS
11-1-77	SEPIA/RO	1
	JHJ	1
	VRS	1
	RGH	1
	E11	1
	E34	1
	KSD	1
	CSD-V	1
	OR/SHELL	2
	USCG	2
12-14-78	ABS	2

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REVISIONS

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		OWNER	
N N	OWNER					DATE	AUTHD	DATE	APPD
–	–	A	ALL	ALL	INITIAL ISSUE	11/13/5		–	–
–	–	B	6		ALT SIZE OF V1516 THRU V1519 FROM 4" TO 2½" DELETE V1513 ALL TO SUIT LATEST AUX TURB REQUIREMENTS H.M.E.				
			6		VALVES RENUMBERED TO AVOID DUPLICATION				
			4		NOTE 3 DELETED EWB	10/25/7		–	–
		C	4		NOTE 3 REINSTATED, VALVE Nº IN NOTE 7 WAS V-1502 VALVE Nº IN NOTE 8 WERE V-1509 & V-1510				
			7		G-11 ADDED-DELETED LATER FOR G-273				
			5		ADDED ORIFICE TABLE				
			6,8		REMOVED LATERS	12/14/7		–	–
		D	7		DELETED G-11 (ADDED TO REF 11)				
			6		ALT'D VLV NOS. WERE V-6001 THRU V-6021	10/5/8			

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		USN	
N N	NAVSHIPS					DATE	AUTHD	DATE	APPD

HULL NO. 613C, 614C, 615C
DWG. NO. 6450-699
REV. D
SHEET 2

HN11-11 X 17 (REV. 1)

K&E 19 1253 10-71 2236•

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TABLE OF CONTENTS	
SH NO.	TITLE
1	TITLE SHEET
2	REVISIONS
3	TABLE OF CONTENTS & LIST OF REFERENCES
4	GENERAL NOTES
5	MATERIAL SCHEDULE
6	VALVE LIST
7	INSTRUMENT LIST
8	EQUIPMENT DATA, FLOW DATA, & DESIGN CHARACTERISTICS TABLES

REFERENCES		
NO.	TITLE	DWG NO.
1	DIAGRAM - DRAIN COLLECTING SYSTEM - ARRANGEMENT	6555-464
2	DIAGRAM - SEAL AND VENT SYSTEM	GEN ELEC 781E976
3	DIAG - AUXILLIARY STEAM SYS - ARR	6450-683
4	DIAG - CONDENSATE RESERVE & MAKE-UP FEED SYS - ARR	6552-380
5	DIAG - MAIN & AUX SEA WATER CIRC SYS - ARR	6550-361
6	DIAG - COMPRESSED AIR SYS - ARR	6454-536
7	TYPICAL ARRANGEMENT OF GAGE PIPING	6750-481
8	DIRECTIONS FOR INSULATING & LAGGING OF PIPES & AUX IN ENG RM	256895
9	DIAG - AUX EXHAUST, BLEED STEAM & RELIEF VALVE ESCAPE SYS	6451-474
10	PP ARR - MISC INSTRUMENTS IN ENG RM	6755-67
11	DIAG - MAIN STEAM SYS - ARR	6440-505
12	DIAGRAM - DRAIN SYSTEM	GEN ELEC 781E974

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-699	REV. A
		SHEET 3

K&E 19 1253 10-71 2236•

NN12-11 X 17 (REV. 1)

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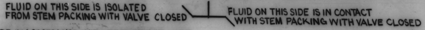
GENERAL NOTES

1. ALL PIPE SIZES SPECIFIED ARE NOMINAL.
2. ALL PIPES, VALVES, AND FITTINGS ARE TO MEET THE REQUIREMENTS OF THE U.S. COAST GUARD AND THE AMERICAN BUREAU OF SHIPPING.
3. ORIFICES SHALL NOT BE LESS THAN 0.18" DIA., AND A DIRT TRAP SHALL BE INSTALLED AHEAD OF EACH ORIFICE.
4. VALVES MARKED THUS ON THE FACE OF THE PLAN SHALL BE INSTALLED AS FOLLOWS:


FLUID ON THIS SIDE IS ISOLATED FROM STEM PACKING WITH VALVE CLOSED
FLUID ON THIS SIDE IS IN CONTACT WITH STEM PACKING WITH VALVE CLOSED

5. GAGE PIPING TO BE IN ACCORDANCE WITH REFERENCE Nº7.
6. INSULATION AND LAGGING REQUIREMENTS SHALL BE IN ACCORDANCE WITH REFERENCE Nº8.
7. THE AIR OPERATED VALVE (V-8001) DRAINING THE MAIN STEAM THROTTLE INLET STRAINER SHALL BE AUTOMATICALLY OPERATED BY THE THROTTLE CONTROL SYSTEM IN ACCORDANCE WITH REFERENCE Nº10.
8. THE SOLENOID OPERATED VALVES (V-8008 & V-8009) FOR THE MAIN FEED PUMP SHALL BE OPERATED AUTOMATICALLY IN CONJUNCTION WITH ITS RELATED MAIN FEED PUMP MOTOR OPERATED FEED SUCTION VALVE. THESE SOLENOID VALVES SHALL FAIL IN THE CLOSED POSITION.
9. THE MAIN TURBINE'S ADJUSTABLE STEAM SEAL REGULATOR MAINTAINS A CONSTANT PRESSURE BETWEEN 1/2 AND 5 PSIG IN THE SEALING POCKET.
10. THE GLAND SEAL STEAM, GLAND EXHAUST AND TURBINE DRAIN PIPING SHALL BE INSTALLED WITH A CONTINUOUS SLOPE BETWEEN DRAIN POINTS SO THAT THE COMPLETE SYSTEM WILL BE FREE OF CONDENSATE, EXCEPT FOR LOOP SEALS, UNDER ALL CONDITIONS.
11. THE CALCULATED MINIMUM THICKNESS IN THE MATERIAL SCHEDULE ON SHEET 5 IS THE MINIMUM THICKNESS ALLOWABLE AFTER ALL PIPE FABRICATION HAS BEEN COMPLETED AND IS IN ACCORDANCE WITH U.S. COAST GUARD MINIMUM THICKNESS REQUIREMENTS.
12. THE ORDERED PIPE THICKNESS SHOWN IN THE MATERIAL SCHEDULE IS BASED ON A MINIMUM BEND RADIUS OF 5 NOMINAL DIAMETERS.
13. JOINTS SUBJECT TO CONDENSER VACUUM SHALL GENERALLY BE FLANGED OR WELDED. WHERE SCREWED JOINTS ARE REQUIRED THEY SHALL BE TINNED OR HEAVILY DOPED.
14. ALL DRAIN LINES TO THE MAIN CONDENSER HOTWELL SHALL ENTER ABOVE THE WATER LEVEL.
15. THE MAIN TURBINE GLAND LEAK-OFF SYSTEM HAS BEEN SIZED TO HANDLE 60% MORE FLOW THAN NORMALLY EXPECTED TO ALLOW FOR INCREASED FLOW DUE TO PACKING WEAR.

HULL NO. 613C, 614C, 615C	DWG NO. 6450-699	REV. B
		SHEET 4

K&E 191253 5-74 W 2847A*

MN 13-11X17 (REV. 1)

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MATERIAL SCHEDULE

SERVICE	ITEM	TYPE	SIZES	MATERIAL	APPLICABLE DOCUMENTS
GLAND SEALING, GLAND EXHAUST, AND TURBINE DRAINS 775°F & BELOW ⊖	PIPING	SEAMLESS	ALL	CARBON STEEL	ASTM-A53-73-GR-B
	FITTINGS	FLANGED	$2\frac{1}{2}$" & ABOVE	CAST CARBON STL	ANSI B16.5-73-150#
		BUTTWELD		FORGED CARBON STL	ANSI B16.9-71-SCH 40
		SOCKET WELD	2" & BELOW	FORGED CARBON STEEL	ANSI B16.11-73-3000#
	LINE JOINTS △	SLIP-ON FLANGES	$2\frac{1}{2}$" & ABOVE	FORGED CARBON STEEL	ANS B16.5-73-150#
		SOCKET WELD STEEL UNION	2" & BELOW	FORGED CARBON STEEL	ANSI B16.11-73 3000# COMMERCIAL
	GASKETS	SHEET	ALL	COMPRESSED ASBESTOS	COMMERCIAL $\frac{1}{16}$" THICK
	FLANGE BOLTING	BOLTS-DOUBLE END	ALL	ALLOY STEEL	ASTM-A193-74-GR B7 OR EQUIV.
		NUTS-HEAVY HEX		CARBON STEEL	ASTM-A194-74-GR4 OR EQUIV.
GLAND SEALING, GLAND EXHAUST, AND TURBINE DRAINS ABOVE 775° ⊖	PIPING	SEAMLESS	ALL	$1\frac{1}{4}$ CR - $\frac{1}{2}$ MO	ASTM-A335-74-GR P11
	FITTINGS	FLANGED	$2\frac{1}{2}$" & ABOVE	CAST $1\frac{1}{4}$ CR - $\frac{1}{2}$ MO	ANSI B16.5-73-150#
		BUTTWELD		FORGED $1\frac{1}{4}$ CR - $\frac{1}{2}$ MO	ANS B16.9-71-SCH 40
		SOCKETWELD	2" & BELOW	FORGED $1\frac{1}{4}$ CR - $\frac{1}{2}$ MO	ANSI B16.11-73-3000#
	LINE JOINTS △	SLIP-ON FLANGES	$2\frac{1}{2}$" & ABOVE	FORGED $1\frac{1}{4}$ CR - $\frac{1}{2}$ MO	ANSI B16.5-73-150#
		SOCKET WELD STEEL UNION	2" & BELOW		ANSI B16.11-73 3000# COMMERCIAL
	GASKETS	SPIRAL WOUND	ALL	METALLIC ASBESTOS STAINLESS STEEL	150# FLEXITALLIC STYLE CG OR EQUIVALENT
	FLANGE BOLTING	BOLTS-DOUBLE END	ALL	ALLOY STEEL	ASTM-A193-74-GR B7 OR EQUIV.
		NUTS-HEAVY HEX		CARBON STEEL	ASTM-A194-74-GR4 OR EQUIV.

PIPE LIST

NOMINAL SIZE	CALC MIN THK (INCH)*	ORDERED THK (INCH)**	SCHEDULE Nº	MATERIAL
8"	.057	.322	40	CARBON STEEL ASTM-A53-GR B
6"	.043	.280		
5"	.036	.258		
4"	.029	.237		
3"	.088	.216		
$2\frac{1}{2}$"	.084	.203		
2"	.081	.154		
$1\frac{1}{2}$"	.077	.145		
1"	.074	.133		
$\frac{3}{4}$"	.072	.154	80	
$\frac{1}{2}$"	.071	.147		
3"	.090	.216	40	$1\frac{1}{4}$ CR - $\frac{1}{2}$ MO ASTM-A335-GR P-11
$2\frac{1}{2}$"	.085	.203		
2"	.082	.154		
$1\frac{1}{2}$"	.078	.145		
1"	.074	.133		
$\frac{3}{4}$"	.072	.154	80	
$\frac{1}{2}$"	.071	.147		

ORIFICES

SIZE	TYPE	MATERIAL	SERVICE
ALL	.018" DIA SQUARE EDGE	CRES	TURB DRAINS

⊖ FOR DRAIN PIPING BETWEEN THE POINT BEING DRAINED AND THE LAST CUTOUT VALVE WHICH MAY BE SUBJECTED TO THE PRESSURE AND TEMPERATURE OF THE SYSTEM BEING DRAINED, SEE RELATED DIAGRAM FOR MATERIAL AND TEST REQUIREMENT.

* SEE NOTE 11

** SEE NOTE 12

△ SEE NOTE 13

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-699	REV. A
		SHEET 5

MN 13-11X17 (REV. 1)

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI B16.5 CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V-8001	1	3/4"	AIR OPERATED	1 1/4 CR - 1/2 MO	900#	FLG ANSI B16.5	*	H.P. STEM CHEST DRAIN	SEE NOTE 7 FURN W/TURBINE	ASTM-A-217 GR WC-6
	V-8002	1	8"	GATE	CARBON STEEL	150#		**	MN AIR EJECTOR GLD EXH COND INLET		ASTM-A-216 GR WCB
	V-8003	1	3"	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ ↓ OUTLET		↓
	V-8004	1	8"	↓	↓	↓	↓	↓	AUX GLAND EXH COND INLET		↓
	V-8005	1	3"	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ OUTLET		↓
	V-8006	1	6"	↓	↓	↓	↓	↓	GLAND LEAK-OFF FROM MN TURBINE		↓
	V-8007	1	2 1/2"	↓	↓	↓	↓	↓	↓ ↓ ↓ SSTG ↓		↓
	V-8008	1	2 1/2"	SOLENOID	↓	↓	↓	↓	↓ ↓ ↓ MN FEED PUMP №1 ↓	SEE NOTE 8	↓
	V-8009	1	2 1/2"	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ №2 ↓	↓	↓
	V-8010	1	2 1/2"	GATE	↓	↓	↓	↓	MAIN FEED PUMP №1 SOLENOID VLV BYPASS		↓
	V-8011	1	2 1/2"	↓	↓	↓	↓	↓	↓ ↓ ↓ №2 ↓ ↓ ↓		↓
B					↓			↓			
	V-8012	1	3/4"	GLOBE STOP	↓	600#	SW ANSI B16.11	↓	STEAM SEAL REGUATOR SENSING	FURN WITH TURBINE	ASTM A-181
	V-8013	1	2 1/2"	GATE	↓	150#	FLG ANSI B16.5	↓	GLAND LK-OFF FROM BALL. P. TURB.		ASTM A-216 GR WCB
B	V-8014	1	↓	↓	↓	↓	↓	↓	↓ ↓ ↓ GARGO ↓ ↓		↓
	V-8015	1	↓	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ ↓		↓
	V-8016	1	↓	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ ↓		↓
B	V-8017	1	↓	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ ↓ ↓		↓
	V-8018	1	3/4"	GLOBE STOP	↓	600#	SW ANSI B16.11	↓	4TH EXTRACTION DRAIN		ASTM A-181
	V-8019	1	3/4"	↓ ↓	↓	↓	↓	↓	5TH ↓ ↓		↓
	V-8020	1	2"	↓ ↓	↓	↓	↓	↓	DFT VENT		↓
	V-8021	1	2"	↓ ↓	↓	↓	↓	↓	DFT VENT		↓

* STAINLESS STEEL WITH STELLITE FACED DISC AND SEAT(S)

** STAINLESS STEEL WITH STELLITE FACED DISC

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-699	
	REV D	SHEET 6 OF

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INSTRUMENT LIST

INST NO	SERVICE	SIZE	RANGE PSI
G-271	GLAND SEAL STEAM	4 ½"	30"-30#
G-272⊕	GLAND SEAL STEAM	–	30"-30#
G-273	STEAM TO GLAND SEAL REGULATOR	4 ½"	0-300#
~~G-11⊕~~	~~H.P. TURBINE DRN 1ST STAGE~~	~~4 ½"~~	~~0-1200~~

INST NO	SERVICE	SIZE	RANGE °F

INST NO	SERVICE	SIZE	RANGE

⊕ LOCATE IN EOS △ H613C & H614C ONLY

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-699	REV. D SHEET 7

MN 13-11X17 (REV. 1)

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EQUIPMENT DATA TABLE

QTY	SERVICE	TYPE	CAPACITY	TOTAL HEAD
1	MAIN GLAND EXHAUST CONDENSER	HORIZONTAL SHELL & TUBE SURFACE TYPE	2600#/HR STM @ 410°F WITH 1100#/HR AIR @ 100°F	—
1	AUXILLIARY GLAND EXHAUST CONDENSER	HORIZONTAL SHELL & TUBE SURFACE TYPE	1800#/HR STM @ 410°F WITH 500#/HR AIR @ 100°F	—
1	GLAND LEAK-OFF EXHAUSTER FAN	HORIZONTAL CENTRIFUGAL MOTOR DRIVEN	500 SCFM AIR @ 150°F	17" H_2O TSP

FLOW DATA TABLE

SYM	SIZE INCH	NOM PRESS	FLOW #/HR	VELOCITY FT PER SEC	CONDITION	SERVICE
A	5	$\frac{1}{2}$-5 PSIG	1854	91 - 200	STAND-BY	GLAND SEAL REGULATOR TO TURBINE GLANDS
B	6"	5" H_2O VAC	763 STM 451 AIR	65	ABS POWER	MAIN TURBINE GLAND LEAK-OFF
C	8"	↓	2009 STM 511 AIR	68	ABS POWER	GLAND LEAK-OFF TO CONDENSER
D	8"	↓	1677 STM 462 AIR	67	RATING	LEAK-OFFS TO AUX GL EXH COND FROM SSTG TURBINE & THE FOLLOWING PUMP TURBINES : CARGO, BALL, FIRE & FEED

DESIGN CHARACTERISTICS

SERVICE	WORKING PRESS	DESIGN PRESS PSIG	HYDRO TEST PRESS	WORKING TEMP °F	DESIGN TEMP °F
GLAND SEAL (G.E. FURNISHED PIPING)	2 PSIG	50 PSIG	SERVICE CONDITIONS	370 - 900	900
GLAND SEAL DUMP TO CONDENSER	28.5" Hg VAC	↓	↓	550	740
MAIN ENGINE GLAND LEAK-OFF FROM H.P. END OF H.P. TURBINE	5" H_2O VAC	↓	↓	487 - 780	800
MAIN ENGINE GLAND LEAK-OFF EXCEPT H.P. END OF H.P. TURBINE	↓	↓	↓	370 - 740	750
SSTG GLAND LEAK-OFF	↓	↓	↓	650	650
MAIN FEED PUMP GLAND LEAK-OFF	↓	↓	↓	360	550
BALLAST PUMP & CARGO PUMP GLAND LEAK-OFF	↓	↓	↓	650	650
FIRE PUMP LEAK-OFF	↓	↓	↓	360	550

HULL NO. 613C, 614C, 615C	DWG. NO. 6450-699	REV. C
		SHEET 8

MN 13-11X17 (REV. 1)

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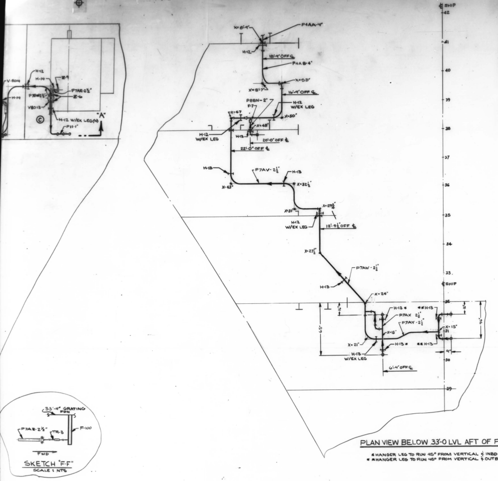


SKETCH "F-F"
SCALE : NTS

PLAN VIEW BELOW 33'-0 LVL AFT OF FR 41

✱ HANGER LEG TO RUN 45° FROM VERTICAL ℄ INBD
✱✱ HANGER LEG TO RUN 45° FROM VERTICAL ℄ OUTBD

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH	OWNER DATE	OWNER APPD
A	–	INITIAL ISSUE	[illegible]	[illegible]	–	–
B	–	PIPING FROM BALLAST PMP TURBINE MODIFIED GER WORK ACCOMPLISHED ON 613C ON SKETCH 6450-700-1			–	–
		VALVE NOS. ALTERED TO AVOID DUPLICATION	7/6/78	[illegible]		
C	–	ALT'D CONFIGURATION OF P8BR-2" IN PLAN VIEW "78'-4" LVL AFT FR 44" GER			–	–
		PIPING FROM BALLAST PMP TURBINE MODIFIED, WORK ACCOMPLISHED ON 613C BY SKETCH 6450-700-1 REV"B" GER	7/24/78	AC		
D	–	PLAN VIEW BEL 33'-0" LVL FWD FR 41; ALT'D RUN OF P4V-4" TO CLEAR 26'-3" GRAT. LVL (WORK ACCOMP ON 613C)	9/16/78		-	-
	–	ALTERED WORDING OF NOTE #11		[illegible]		
E	–	ALT'D CONFIGURATION OF P4AA-4" & P4AB-4". ADDED P11-1" DRAIN LINE AT LOW POINT. RE-ORIENTED V-8006 & ADDED REF #9 GER				
		ADDED F-21, SALINITY CELL TO P9BV-1½" GER				
		ALT'D CONFIGURATION OF P7AT-2½" & P4T-4". ADDED P7BW-2½" GER	11/29/78	[illegible]	–	–
F		PLAN VIEW BELOW 33'-0" LVL FWD OF FR 41; ALT'D LOCATION OF MN AIR EJECT GLAND EXH COND LOOP SEAL. (WORK ACCOMP ON 613C BY LIAISON NO. 613C-1111-54)				
		PLAN VIEW 106'-0" LVL; ADDED 1" DRAIN FROM V-8020, MADE NOTE TO REF'S 10 & 11.	3/9/79	AC		
	1A	ADDED REF'S 10 & 11.		[illegible]	–	–

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REF #1,2
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING, SEE REF #2 FOR LIST OF ACCEPTABLE MATERIAL.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS & SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., ABS & REF 3.
4. ALL BUTT WELDS ARE P3, SOCKET WELDS P14, FLANGE WELDS P16A & ARE IN ACCORDANCE WITH REF #3 UNLESS OTHERWISE NOTED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS & HANGERS DO NOT INFRINGE ON THE SPACE REQ'D FOR OVERHAUL OF HEAT EXCHANGERS, PUMPS, ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO THE BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REF #5.
8. TESTS ARE TO BE IN ACCORDANCE WITH REF #1 & 2.
9. PIPE HANGERS ARE TO BE IN ACCORDANCE WITH REF #7 UNLESS OTHERWISE NOTED.
10. BACKING RINGS & COUPLINGS ARE TO BE USED AS REQ'D.
11. ALL PIPING ON THIS DRAWING IS CLASS II EXCEPT THE FOLLOWING WHICH IS CLASS I (SERVICE TEMP ABOVE 650° F): LEAKOFF PIPING FROM H.P. & L.P. TURBINES UP TO V-6006 INCLUDING DRAIN BRANCHES UP TO TOP OF LOOP SEAL.
12. DRAIN PIPING BETWEEN FRESH WATER DRAIN COLLECTING TANK & LOOP SEALS SHALL BE SUPPORTED WITH STD FIXED HGRS IN ACCORDANCE WITH REF #7.
13. DRAIN COLLECTING TANK VENT IS TO BE SIMILARLY SUPPORTED EXCEPT AS NOTED ON PLAN.

FOR ELEV & SECT SEE DWG 6450-701
FOR LIST OF MATL SEE DWG 6450-702
FOR PIPE DETS SEE DWG 6450-844

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS	
ZAPATA 11-23-77	ABS
SHELL 11-9-77	USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL DESIGN DIV.
FSCM NO. 43689
DEPT.

NO.	REFERENCES	DWG NO.
11	ARR OF FLR PLTS, GRATINGS & LADDERS - 78'-4" LVL & ABOVE - ER.	6650-238
10	PIPING ARR - DIRTY DRAINS - ER	6555-472
9	OPER GR & EXT STEMS FOR VLVS IN MACH SP	257336
8	LP STM DRN SYS IN ER, PLAN, SECT & EL	6555-466
7	STD PIPE HANGERS & INSTALLATION INSTR	257056
6	PIPE DET - TURB GL LK OFF SYS	6450-702
5	PAINTING SCHED -	8300-40
4	ARR PIPING IN OUTER SMOKESTACK PLAN SECT & ELEV	6451-499
3	FAB & WELDING INSTRUCTIONS - CL I & II PIPING	257035
2	DIAG GL SEAL, LKOFF & TURB DRAIN SYS - L/M	6450-699
1	DIAGRAM GL SEAL, LKOFF & TURB DRAIN SYS - ARR -	6450-698

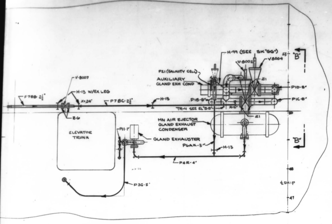
Ⓕ

SCALE ½" = 1 FT
DRAWN RICE, GE
CHECKED [illegible]
SECT MGR [illegible]
DATE COMPL. 10-4-77
EXAMINED —
AUTHORIZED A. Conley
DATE 10-5-77
TECH APPROVAL
CSD APPROVAL R. L. Waring

PIPING ARRANGEMENT - TURBINE GLAND LEAKOFF SYS - PLAN -

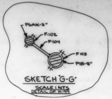
USMA DESIGN
USMA DWG NO.
HULL NO.
DWG NO. 6450-700
REV F
SHEET NO. 1 OF 1

6450-700
MICRO-MASTER 105 mm
K+E
SEPT. '80
FRAME 1
10X



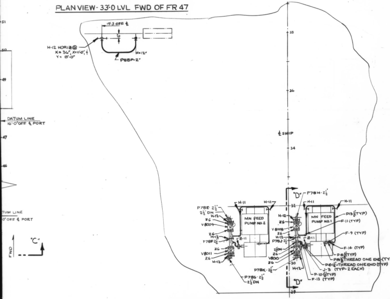
H-99 (SEE SK "GG")
V-8002
V-8004
"B"
F21 (SALINITY CELL)
AUXILIARY GLAND EXH COND
V-8007
F7BB-2½"
H-13 W/EX LEG
X=24"
P7BC-2½"
H-13
Z-6
TR-4 SEE EL "B-B"
P1B-8"
H-14
Z1
P1D-8"
P1C-8"
MN AIR EJECTOR GLAND EXHAUST CONDENSER
ELEVATOR TRUNK
P11-1"
GLAND EXHAUSTER
P6AK-3"
H-13
"B"
P4R-4"
P3G-5"
℄ SHIP
48
47

PLAN VIEW - 33'-0 LVL FWD OF FR 47



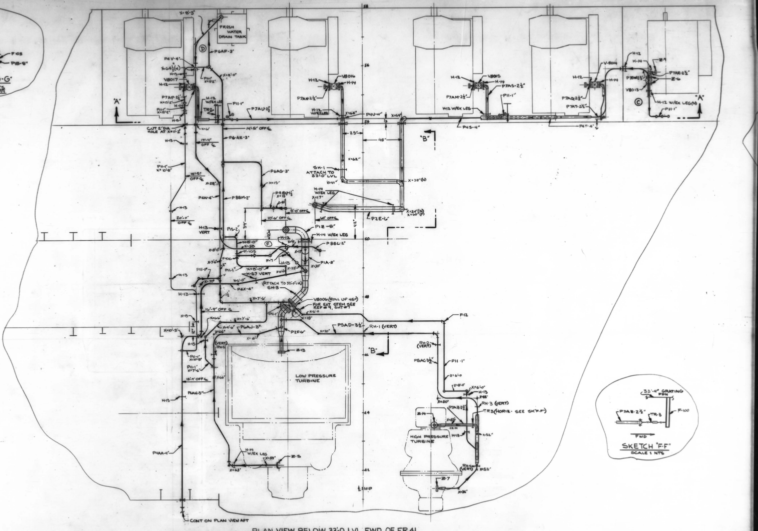
P6AK-3"
F-102
F-104
F-103
P1B-8"

SKETCH "G-G"
SCALE: NTS
DETAIL OF H-99



19'-3 OFF ℄
H-12 HORIZ @ X=36", X=11'-0" ℄, Y=8'-0"
X=12"
P8BP-2"
DATUM LINE 16'-0" OFF ℄ PORT
DATUM LINE 16'-0" OFF ℄ PORT
"C"
FWD
℄ SHIP
36
34
"D"
F7BH-2½"
H-11
MN FEED PUMP NO. 2
MN FEED PUMP NO. 1
P7BE-2½" 2½ DN
H-12
Z6
V-8009
P7BF-2½
Z-11
V8011
H-12
P7BG-2½" 2½ DN
P7BK-2½"
V-8008
V8010
P7BJ-2½"
P13-½"(TYP)
F-11 (TYP)
F-9 (TYP)
F-14 (TYP)
P-8-½"(TYP)
THREAD ONE END (TYP)
P-10-½" THREAD ONE END (TYP)
J-3 (TYP-2 EACH)
P-10-½"(TYP)
F-13 (TYP)
"D"

PLAN VIEW - 33'-0" LVL AFT OF FR 38



58
56
54
52
50
48
46
44
42
X=8'-3"
FRESH WATER DRAIN TANK
P6AF-3"
P4V-4"
V8017
H-12
P7AP-2½"
P11-1"
H-12 W/EX LEG
TR-2
P7AU-2½"
V8016
H-12
H-14
P7AN-2½"
H-12 W/EX LEG
X=54"
P4U-4"
V8015
P7AM-2½"
P7AS-2½"
P11-1"
H-12 W/EX LEG
P4S-4"
V-8014
V8013
P7AQ-2½"
P7AT-2½"
P7AR-2½"
Z-6
H-12 W/EX LEG
P11-1"
P4T-4"
"A"
"A"
CUT 2" DIA HOLE AT X=11'-2"
14'-6" OFF ℄
P6-AE-3"
17'-4" OFF ℄
25"
48"
"B"
X=62"
SH-1 ATTACH TO 33'-0" LVL
P11-1"
18'-5" OFF ℄
X=58"
P6AG-3"
P4W-4"
P8BM-2"
P8BH-1½"
H-14 W/EX LEG
X=38"
P2E-6"
8'-0" OFF ℄
10'-6" OFF ℄
H-13
20'-11" OFF ℄
H-13 VERT
P15-2"
12'-0"
P1Z-8"
H-14 W/EX LEG
P8BL-2"
F-105
F-7
P1A-8"
P11-1"
X=8'-0"
H-57 VERT
P4X-4"
ATTACH TO 33'-0" LVL SH-3
V8006 (ROLL UP 45°)
FOR EXT STEM SEE REF #4, SHT #7
H-13
16'-9" OFF ℄
P6AJ-3"
P11-1"
P2F-6"
P5AD-3½"
RH-1 (VERT)
F-12
Z-13
"B"
RH-2 (VERT)
P5AC-3½"
P11-1"
X=61.0
H-13
LOW PRESSURE TURBINE
18'-4" OFF ℄
P6AH-3"
RH-3 (VERT)
P7AZ-2½"
TR-3 (HORIZ - SEE SK "F-F")
Z-14
H-13
HIGH PRESSURE TURBINE
H-14 W/EX LEG
Z-5
P4AA-4"
RH-4 (VERT)
Z-7
℄ SHIP
CONT ON PLAN VIEW AFT
33'-4" GRATING FDN
P7AZ-2½"
TR-3
F-100
FWD

SKETCH "F-F"
SCALE: NTS

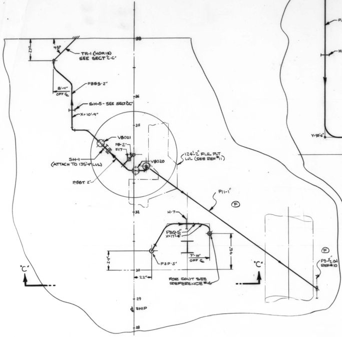
PLAN VIEW BELOW 33'-0 LVL FWD OF FR 41

6450-700

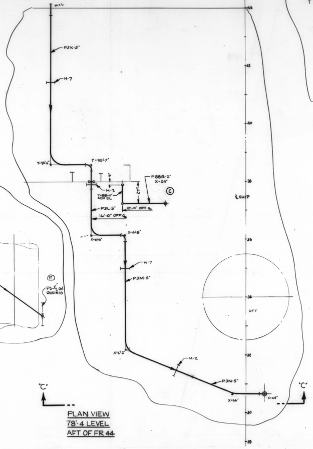
SEPT. '80

FRAME 2

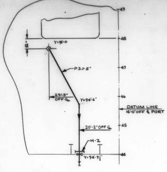
10X


TR-1 (HORIZ) SEE SECT "C-C"
45°
27"
PBBS-2"
8'-4" OFF ℄
SH-5 - SEE SECT "C-C"
X=10'-9"
VB021
PB-2" F17
SH-9 (ATTACH TO 135'-4" LVL)
VB020
124'-2" FLR PLT LVL (SEE REF #11)
PBBT 2"
P11-1"
F
H-7
P3Q-5"
P3P-5"
7'-10" OFF ℄
22"
FOR CONT SEE REFERENCE #4
P3-½" ON REF #10
"C"
℄ SHIP

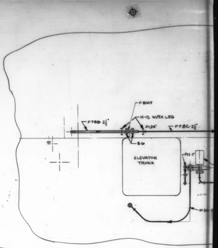
PLAN VIEW - 106'-0" LEVEL


P3K-5"
H-7
Y=98'-6"
Y=95'-7"
H-2
Y=96'-4" ABV BL
P3L-5"
16'-0" OFF ℄
PBBR-2" X=24"
27"
12'-4" OFF ℄
C
X=10'-0"
X=6'-8"
H-7
P3M-5"
℄ SHIP
DFT
X=6'-2"
H-2
P3N-5"
X=66"
X=64"
"C"

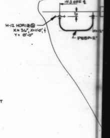
PLAN VIEW
78'-4 LEVEL
AFT OF FR 44

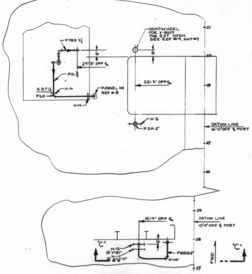

Y=98'-0
12"
P3J-5"
23'-8" OFF ℄
Y=94'-6"
20'-2" OFF ℄
DATUM LINE 16'-0" OFF ℄ PORT
H-2
Y=94'-9½"
49
48
47
46
45
44

PARTIAL PLAN VIEW
78'-4" LEVEL - FWD FR 44


V-8007
H-13 W/EX LEG
F7BB-2½"
X=24"
P7BC-2½"
H-6
ELEVATOR TRUNK
P11-1"
P3G-5

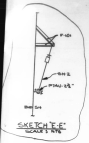
PLAN VIEW - 33'-0 LVL FW


19'-3" OFF ℄
H-12 HORIZ @ X=36", X=11'-0", Y=8'-0"
PBBP-2"

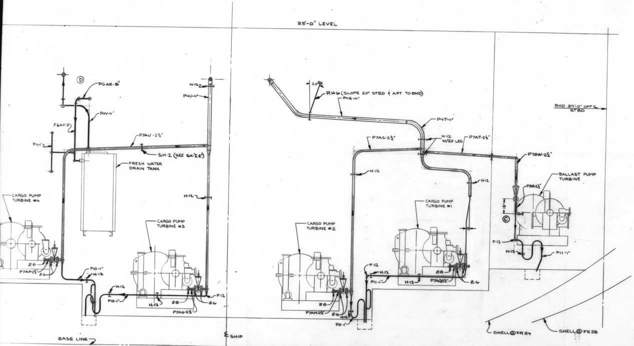

P7BD 2½"
HANDWHEEL FOR V-8007 FOR EXT. STEM SEE REF #9, SHT #7
29'-3" OFF ℄
P12-½"
SSTG F20
H-14
FUNNEL ON REF #8
28'-8" OFF ℄
H-2
P3H-5"
DATUM LINE 16'-0" OFF ℄ PORT
51
50
49
48
47
46
15'-9" OFF ℄
DATUM LINE 10'-0" OFF ℄ PORT
H-12 @ Y=81"
H-14 @ X=11'-0"
PBBQ-2"
X=48"
39
38
37
FWD
"C"

PARTIAL PLAN VIEWS
60'-0" LEVEL

6450-700
MICRO-MASTER 105 mm
K+E
SEPT. '80
FRAME 3
10X


F-101
SH-2
P7AU-2½"
BHD 54

SKETCH "E-E"
SCALE: NTS


33'-0" LEVEL
Ⓓ
P6AE-8"
P4U-4"
P4V-4"
H-12
P6AF-3"
P11-1"
P7AU-2½"
SH-2 (SEE SK-"E-E")
FRESH WATER DRAIN TANK
CARGO PUMP TURBINE #4
CARGO PUMP TURBINE #3
Z-8
Z-6
P7AP-2½"
P10-1"
H-12
F-12
P7AN-2½"
RH-6 (SLOPE 20° STBD & AFT TO BHD)
P4S-4"
P4T-4"
P7AS-2½"
H-12 W/EX LEG
P7AT-2½"
P7BW-2½"
BHD 39'-0" OFF ℄ STBD
BALLAST PUMP TURBINE
P7AR-2½"
18"
Ⓒ
CARGO PUMP TURBINE #1
CARGO PUMP TURBINE #2
P7AQ-2½"
P7AM-2½"
P11-1"
BASE LINE
℄ SHIP
SHELL @ FR 54
SHELL @ FR 58

SECTION "A-A"
FR 54 LKG FWD TO FR 58

PORT

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	AUTH'D	OWNER DATE	APP'D
A	-	INITIAL ISSUE	10/4/7	KY	-	-
B	-	PIPING FROM BALLAST PMP TURBINE MODIFIED WORK ACCOMPLISHED ON 613C ON SKETCH 6450-700-1 GER				
	-	VALVE NUMBERS ALT TO AVOID DUPLICATION.	3/6/8	AC KY	-	-
C	-	SECT 'C-C' - ALT'D CONFIG OF P8BR-2" GER				
	-	ALT'D CONFIG OF PIPING FROM BALLAST PMP TURBINE WORK ACCOMPLISHED ON 613C BY SKETCH 6450-700-1 REV "B" GER	11/11/8	AC KY	-	-
D	-	SECT 'A-A', ALT'D RUN OF P4V-4" (WORK ACCOMP. ON 613C)	4/6/8	KY	-	-
	-	ADDED EXT STEM FOR V-8006 GER				
E	-	ALT'D CONFIGURATION OF P4AA-4" & ADDED 1" DRAIN LINE (P11-1") AT LOW POINT				
		ADDED F-21 (SALINITY CELL) TO P9BV-1½" GER				
		ALT'D CONFIGURATION OF P7AT-2½" & P4T-4". ADDED P7BW-2½" GER	10/25/8	AC KY	-	-
F	-	ALT'D MN AIR EJECT GLAND EXH COND LOOP SEAL (WORK ACCOM ON 613 BY LIAISON NO. 613C-343-54)				
		SECT 'C-C', ADDED F22, F23, F24 & P11-1", ADDED NOTE TO REF'S NO 10 & 11.	3/9/9	AC KY		

AUTHORITY:

GENERAL NOTES:

FOR PLAN VIEWS, NOTES & REFERENCES SEE REFERENCE 1

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C 614C 613C	311 310 309	

APPROVALS

OWNERS ZAPATA 11-23-77	ABS
SHELL 11-9-77	USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL DESIGN DIV.
FSCM NO. 43689
DEPT.

SCALE 1/2" = 1 FT
DRAWN RICE, G.E.
CHECKED
SECT MGR J. K. Johnson
DATE COMPL. 10-9-7
EXAMINED
AUTHORIZED A. Conley
DATE 10-9-77
TECH APPROVAL
CSD APPROVAL R. T. Harrington

PIPING ARR.-TURBINE GLAND LEAKOFF SYS.-SECT. & ELEV.

USMA DESIGN
USMA DWG NO.
HULL NO.

NO.	REFERENCES	DWG NO.
1	PIPING ARR - TURB GLAND LKOFF SYS - PLAN	6450-700

DWG NO. 6450-701
REV F
SHEET NO. 1 OF 1

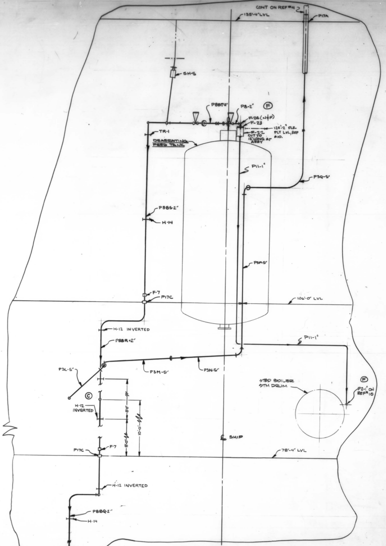
REPRODUCTION OFFICE	
YARD PRINTS YES	GROUPING NO
DATE 1-30-7	

DWG. REV.—HULL APPLIC
GROUP:
MC NO.

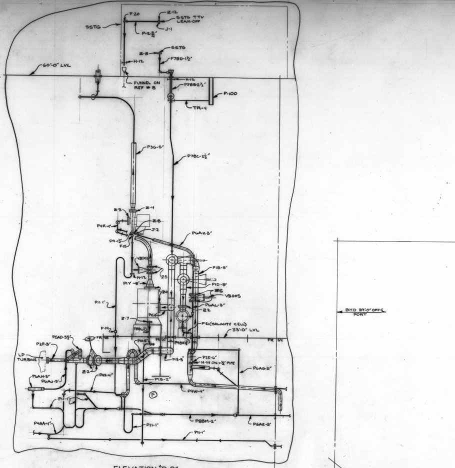
6450-701

SEPT. '80
FRAME 1
10X

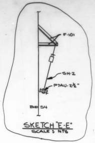
D-D


CONT ON REF #4
135'-4" LVL
P17A
SH-5
P8BT-2"
P8-2"
Ⓕ
F-24 (N&F)
F-23
F-22 CUT TO 12' LONG AT ASSY
124'-2" FLR PLT LVL, REF #10.
TR-1
DEAERATING FEED TANK
P11-1"
P3Q-5"
P8BS-2"
H-14
P3P-5"
F-7
P17C
106'-0" LVL
H-12 INVERTED
P8BR-2"
P11-1"
P3L-5"
P3M-5"
P3N-5"
Ⓒ
STBD BOILER STM DRUM
Ⓕ
P2-1" ON REF #10
H-12 INVERTED
8'-0"
10'-0"
℄ SHIP
P17C
F-7
78'-4" LVL
H-12 INVERTED
P8BQ-2"
H-14

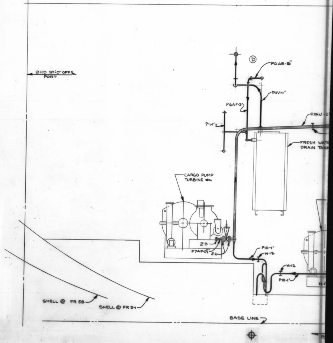
SECTION "C-C"
FR 29 LKG FWD
PORT


SSTG
F-20
Z-12
SSTG TTV LEAK-OFF
J-1
F-12 ¾"
Z-8
SSTG
H-12
F78D-1½"
60'-0" LVL
FUNNEL ON REF # 8
H-12
P78B-2½"
F-100
TR-4
P3G-5"
P78C-2½"
Z-3
Z-4
P4R-4"
Z-8
J-2
P4-1½"
F-15
P6AK-3"
V8005
H-12
P1Y-8"
P1B-8"
P1D-8"
V8005
P11-1"
P6AL-3"
Z2
F-21 (SALINITY CELL)
Z-7
F-19
33'-0" LVL
FR 54
P5AD-3½"
P2F-3"
LP TURBINE
P6AH-3"
P6AJ-3"
Z-2
P4X-4"
P1S-2"
P2E-6"
H-14 ON 1½" PIPE
P6AG-3"
P11-1"
P4W-4"
Ⓕ
P4AA-4"
P11-1"
P8BM-2"
P6AE-3"
P11-1"

ELEVATION "B-B"
℄ LKG TO PORT
FWD


F-101
SH-2
P7AU-2½"
BHD 54

SKETCH "E-E"
SCALE: NTS


BHD 39'-0" OFF ℄ PORT
Ⓓ
P6AE-3"
P4V-4"
P6AF-3½
P7AU-2
P11-1½
FRESH WATER DRAIN TANK
CARGO PUMP TURBINE #4
Z8
P7AP-2½"
Z-6
P10-1"
H-12
H-12
P10-1"
SHELL @ FR 58
SHELL @ FR 54
BASE LINE

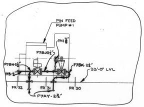
6450-701

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.

SEPT. '80

FRAME 2

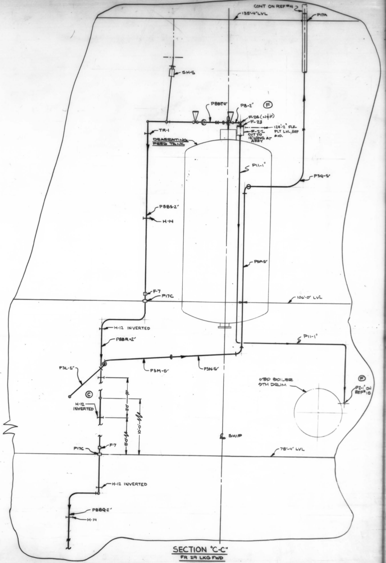
10X


MN FEED
PUMP #1
P14 3/8"
P7BJ-2½"
P7BH-2½"
P15-½"
P7BK-2½"
33'-0" LVL
FR 32
FR 31
FR 30
P7AY-2½"

ELEVATION "D-D"

℄ LKG STBD

FWD


CONT ON REF #4
135'-4" LVL
P17A
SH-5
P8BT-2"
P8-2"
F
F-24 (N&F)
F-23
F-22
CUT TO
12" LONG AT
ASSY
124'-2" FLR
PLT LVL, REF
#10.
TR-1
DEAERATING
FEED TANK
P11-1"
P3Q-5"
P8BS-2"
H-14
P3P-5"
F-7
P17C
106'-0" LVL
H-12 INVERTED
P8BR-2"
P11-1"
P3L-5"
P3M-5"
P3N-5"
STBD BOILER
STM DRUM
F
P2-1" ON
REF #10
C
H-12
INVERTED
8'-0"
10'-0"
8'-0"
℄ SHIP
F-7
P17C
78'-4" LVL
H-12 INVERTED
P8BQ-2"
H-14

SECTION "C-C"

FR 29 LKG FWD

PORT

6450-701

SEPT. '80
FRAME 3
10X

6450-702 CSD VAULT

REPRODUCTION OFFICE

YARD PRINTS YES

REMARKS

GROUPING YES

DATE 3-7-9

SIGNED

YARD PRINTS | ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. ____

REV. STATUS OF SHEETS																								
	REV.	E	E	A	A	A	A	A	C	A	A	A	D	D	D	C	A	A	C	A	C	A	C	E
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

GROUP

MC NO.

PARTIAL ISSUE
SHEETS 1, 2, 23 ONLY

NNS&DDCo. HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C	311		
614C	310		
613C	309	T11-S-116a	

DWG. REV. — HULL APPLIC.

REV.	NN HULLS ONLY 613	614	615
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	NO
E	YES	YES	NO

APPROVALS

OWNERS
ZAPATA · 11-23-77
SHELL · 11-9-77

ABS

USCG

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

FSCM NO. 43689

~~COMMERCIAL SHIP~~ DESIGN DIVISION DEPT. ____

INSTALLATION GROUP: 6450-0106-1101 PI
6450-0105-1101 PI
6450-0104-1101 PI
6450-0105-1002 SI
6450-0113-1105 SI
6450-0119-1101 PI
6450-1601-1001 PI

ARR DWG - 6450-700
PIPE DET - 6450-844

SCALE NTS =1 Ft.
DRAWN G.E. RICE
CHECKED E.W. Buckingham
SECT. MGR. J. B. Johnson
DATE COMPL. 10-4-77
EXAMINED
AUTHORIZED A. Conley
DATE 10-5-77
TECH. APPROVAL
CSD APPROVAL R. L. Warrington

HULL 613C | GROUP NO. | KEY

TYPE OF DWG.

GROUPED: CHK. BY
DATES: COMP. PART

TITLE PIPING ARRANGEMENT-
TURBINE GLAND LEAKOFF SYS-
LIST OF MATERIAL

DWG. NO. 6450-702 REV E SHEET NO. 1 OF 23

MS 8½ X 14

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	AUTH'D.	OWNER DATE	APPD.
A	ALL	INITIAL ISSUE	10/4/7		—	—
B	23	GROUP NO WAS 6450-0105-1002 GER	4/27/78			
C	20	SOURCE ALT - WAS PO 6000 C-13				
	8	S/M CORRECTED FOR LINES 5 & 7.				
	8	ALT'D VLV NOS. LINES 5,6,7,8				
	15	↓ 1,2,3,4,5,6				
	18	↓ 3				
	22	↓ 12,13				
	13	INCREASED QTY LINE 7, WAS 240'-0" GER WORK ACCOMPLISHED ON 613C	7/6/78	AC	—	—
D	13	INCREASED QTY LINE 7, WAS 255'-0" ADDED LINE 11				
	14	INCREASED QTY LINE 6, WAS 16	10/25/78	AC		
	12	ADDED LINE 16 GER WORK ACCOMPLISHED ON H613C				
E	23	ADDED LINES 9 THRU 15.	3/9/9			

GENERAL NOTES:
1. FOR ADDITIONAL INFORMATION ON MAT'L DESCRIPTION SEE REF #1

NO.	REFERENCES	DWG. NO.
1	DIAGRAM GL SEAL LK OFF & TURB DR SYS - L/M	6450-699

HULL NO. DWG. NO. 6450-702 SHEET 2 OF ____

MS46 8½ X 14

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P7AW	2½" IPS x STD THK PIPE-STL	PIPE DETAIL 6450-844	PS	
		2	1	P7AX	2½" ↓	↓	↓	
		3	1	P7AY	2½" ↓	↓	↓	
		4	1	P7BE	2½" ↓	↓	↓	
		5	1	P7BF	2½" ↓	↓	↓	
		6	1	P7BG	2½" ↓	↓	↓	
		7	1	P7BH	2½" ↓	↓	↓	
		8	1	P7BJ	2½" ↓	↓	↓	
		9	1	P7BK	2½" ↓	↓	↓	
		10	24"	P10	1¼" IPS x STD THK PIPE-STL	S/57-06-105	↓	
		11	28'-0"	P13	½" IPS x SCH 80	S/57-07-102	↓	
		12	18"	P14	⅜" IPS x ↓	S/57-07-101	↓	
		13						
		14						
C		15	1	V-8008	2½" SOLENOID OPR VALVE FLGD	PO ① 6450-C30	MD-PS	
C		16	1	V-8009	2½" ↓	PO ① 6450-C30	↓	
C		17	1	V-8010	2½" GATE V- FLGD	PO (37) 6451-M3	↓	
C		18	1	V-8011	2½" ↓	PO (37) 6451-M3	↓	

REMARKS -

SHEET 1 OF 3

SERVICE - TURBINE GLAND LEAKOFF

GROUP NO. 6450-0106-1101 PI

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6450-702 SHEET 3 REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	7	F-6	2½" BACKING RING - STL-STD	S/97-18-124	ST-PS	
		2	2	F-9	⅜ UNION SOC WELD - STL 3000#	PO ⑤ 6950-C11	MD-PS	
		3	4	J-3	1¼" 150# FLG - STL	S/25-18-567	ST-PS	
		4	2	F-11	½" 90° ELL - SOC WELD 3000# STL	S/97-14-998	↓	
		5	4	F-13	1¼" ↓	S/97-14-019	↓	
		6	2	F-14	½" x ⅜" RED. COUPLING - 3000# STL SOC WELD	S/97-16-156	↓	
		7						
		8						
		9						
		10	4	H-11	½" STD HGR W/¼" LINER	S/25-46-326	ST-PS	
		11	6	H-12	2-½" ↓	S/25-47-386	↓	
		12	5	H-13	2-½" ↓	S/25-48-386	↓	
		13	1	H-12	2-½" ↓ W/EX LEG	S/25-47-386	↓	
		14	1	H-13	2-½" ↓	S/25-48-386	↓	
		15						
		16						
		17						
		18						

REMARKS -

SHEET 2 OF 3

SERVICE - TURBINE GLAND LEAKOFF

GROUP NO. 6450-0106-1101 PI

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6450-702 SHEET 4 REV. A

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	32	Z-6	2½"	BOLTS	⅝" HVY HEX HD L= 2¾"	PO 6000-C-13 (50)	MD-PS	
	2	32			NUTS	⅝" HVY HEX	PO 6000 C-12 (18)	↓	
	3	8			GSKT	1/16 COMPR. ASBESTOS 150# ASA	S/15-01-272	ST-PS	
	4	8	Z11	1¼"	BOLTS	½" HVY- HEX HD L= 2¼"	PO 6000-C-13 ④	MD-PS	
	5	8			NUTS	½" HVY HEX	PO 6000-C-13 (52)	↓	
	6	2			GSKT	1/16" COMPR. ASBESTOS 150# ASA	S/15-01-266	ST-PS	
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SHEET 3 OF 3

SERVICE - TURBINE GLAND LEAKOFF

GROUP NO. 6450-0106-1101 PI

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6450-702 SHEET 5 REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P4AA	4" IPS x STD THK PIPE-STL	PIPE DETAIL 6450-844	PS	
		2	1	P4AB	4" ↓	↓	↓	
		3		↓	2½" ↓	↓	↓	
		4		↓	2" ↓	↓	↓	
		5			↓	↓	↓	
		6	1	P7AV	2½" ↓	↓	↓	
		7	1	P8BN	2" ↓	↓	↓	
		8						
		9						
		10	2	F-4	4" BACKING RING - STD - STL	S/97-18-131	ST-PS	
		11	1	F-6	2½" ↓	S/97-18-124	↓	
		12	1	F-7	2" COUPLING - SOC WELD 3000# STL	S/97-14-307	↓	
		13	1	H-12	4" STD HGR W/¼" LINER	S/25-47-416	↓	
		14	1	H-12	2-½" ↓ W/EX LEG	S/25-47-386	↓	
		15	1	H-12	4" ↓ W/EX LEG	S/25-47-416	↓	
		16	2	H-13	2-½" ↓	S/25-48-386	↓	
		17	1	H-13	2" ↓	S/25-48-376	↓	
		18	1	H-13	4" ↓	S/25-48-416	↓	

REMARKS -

SHEET 1 OF 1

SERVICE - TURBINE GLAND LEAKOFF

GROUP NO. 6450-0105-1101 PI

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6450-702 SHEET 6 REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1B	8" IPS x STD THK PIPE - STL	PIPE DETAIL 6450-844	PS	
		2		↓	6" IPS ↓	↓	↓	
		3		↓	2½" IPS ↓	↓	↓	
		4	1	P1A	8" ↓	↓	↓	
		5		↓	6" ↓	↓	↓	
		6		↓	4" ↓	↓	↓	
		7	1	P1C	8" ↓	↓	↓	
		8	1	P1D	8" ↓	↓	↓	
		9		↓	6" ↓	↓	↓	
		10	1	P4V	4" ↓	↓	↓	
		11	1	P4W	4" ↓	↓	↓	
		12	1	P4X	4" ↓	↓	↓	
		13	1	P9BV	1-½" 1" ↓	↓	↓	
		14	1	P1Z	8" ↓	↓	↓	
		15	1	P1Y	8" ↓	↓	↓	
		16		↓	3" ↓	↓	↓	
		17	1	P2E	6" ↓	↓	↓	
		18		↓	4" ↓	↓	↓	

REMARKS -

SHEET 1 OF 4

SERVICE - TURBINE GLAND LEAKOFF

GROUP NO. 6450-0104-1101 PI

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6450-702 SHEET 7 REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P6AL	3" IPS x STD THK PIPE-STL	PIPE DET 6450-844	PS	
		2		↓	2" ↓	↓	↓	
		3	1	P8BL	2" ↓	↓	↓	
		4	1	P9BU	1-½" ↓	↓	↓	
C		5	1	V-8002	8" GATE VLV-FLG-STL	PO (35) 6451-M3	MD-PS	
C		6	1	V-8003	3" ↓	PO (47) 6451-M3	↓	
C		7	1	V-8004	8" ↓	PO (35) 6451-M3	↓	
C		8	1	V-8005	3" ↓	PO (47) 6451-M3	↓	
		9						
		10	2	F-1	8" BACKING RING-STL-STD	S/97-18-137	ST-PS	
		11	6	F-4	4" ↓	S/97-18-131	↓	
		12	1	F-2	6" ↓	S/97-18-108	↓	
		13	1	F-6	2½" ↓	S/97-18-124	↓	
		14						
		15						
		16						
		17						
		18						

REMARKS -

SHT 2 OF 4

SERVICE - TURBINE GLAND LEAKOFF

GROUP NO. 6450-0104-1101 PI

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6450-702 SHEET 8 REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	2	H-12	2" STD HGR W/¼" LINER	S/25-47-376	ST-PS	
		2	5	H-13	4" ↓	S/25-48-416	↓	
		3	1	H-14	1½" ↓	S/25-49-366	↓	
		4	2	H-14	6" ↓ W/EX LEG	S/25-49-436	↓	
		5	1	H-14	8" ↓	S/25-49-446	↓	
		6	1	H-57	4" SWING HGR	MO 283200 S-8 L-7	↓	
		7	1	SH-1	4" SPRING HGR	PO (119) 6552-C16	MD-PS	
		8	1	SH-3	6" ↓	↓ (121)	↓	
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SH 3 OF 4

SERVICE - TURBINE GLAND LEAKOFF

GROUP NO. 6450-0104-1101 PI

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6450-702 SHEET 9 REV. A

6450-702

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	32	Z1	8"	BOLTS	3/4" HVY HEX HD L=3 1/2"	PO 6000-C-7 ⑳	MD-PS	
	2	32			NUTS	3/4" HEX HVY	PO 6000-C-12 ⑭	↓	
	3	4			GSKT	1/16" ASBESTOS 150# STD	S/15-01-284	ST-PS	
	4	8	Z2	6"	BOLTS	3/4" HVY HEX HD L=3 1/4"	PO 6000-C-7 ㉑	MD-PS	
	5	8			NUTS	3/4" HEX HVY STL	PO 6000-C-12 ⑭	↓	
	6	1			GSKT	1/16" ASBESTOS 150# STD	S/15-01-282	ST-PS	
	7	-	Z10	8"	BOLTS	FURN WITH MN AIR EJECTOR	-	↓	
	8	-			NUTS	↓	-	↓	
	9	2			GSKT	1/16" ASBESTOS 150# STD	S/15-01-284	ST-PS	
	10	8	Z-5	3"	BOLTS	5/8" HVY HEX HD L=3"	PO 6000-C13 ㊾	MD-PS	
	11	8			NUTS	5/8" HVY HEX	PO 6000-C-12 ⑱	↓	
	12	2			GSKT	1/16" ASBESTOS 150# STD	S/15-01-274	ST-PS	
	13	4	Z-7	2"	BOLTS	5/8" HVY HEX HD L=2 1/2"	PO 6000-C7 ㉗	MD-PS	
	14	4			NUTS	5/8" HVY HEX	PO 6000-C12 ⑱	↓	
	15	1			GSKT	1/16" ASBESTOS 150# STD	S/15-01-270	ST-PS	
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SHEET 4 OF 4
SERVICE - TURBINE GLAND LEAKOFF
GROUP NO. 6450-0104-1101 PI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-702 SHEET 10 REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P5AD	3 1/2" IPS x STD THK PIPE-STL	PIPE DETAIL 6450-844	PS	
		2			↓	↓	↓	
		3						
		4	1	P2F	6"			
		5		↓	3 1/2"			
		6		↓	3"			
		7	1	P4S	4"			
		8	1	P6AJ	3"			
		9	1	P4T	4"			
		10		↓	2 1/2"			
		11	1	P4U	4"			
		12		↓	2 1/2"			
		13	1	P5AC	3 1/2"			
		14		↓	2 1/2"			
		15		↓	2"			
		16	1	P6AH	3"			
		17	1	P6AG	3"			
		18		↓	2" ↓	↓	↓	

REMARKS -

SHEET 1 OF 6
SERVICE - TURBINE GLAND LEAK-OFF
GROUP NO. 6450-0105-1002 SI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-702 SHEET 11 REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P6AE	3" IPS x STD THK PIPE-STL	PIPE DETAIL 6450-844	PS	
		2	1	P6AF	3"	↓	↓	
		3	1	P7AU	2 1/2"			
		4	1	P7AS	2 1/2"			
		5	1	P7AT	2 1/2"			
		6	1	P7AQ	2 1/2"			
		7		↓	1 1/2"			
		8	1	P7AN	2 1/2"			
		9		↓	1 1/2"			
		10	1	P7AP	2 1/2"			
		11		↓	1 1/2"			
		12	1	P7AM	2 1/2"			
		13		↓	1 1/2"			
		14	1	P8BM	2"			
		15		↓	1 1/2" ↓	↓		
D		16	1	P7BW	2 1/2" IPS x STD THK PIPE-STL	PMO 6450-844	↓	
		17						
		18						

REMARKS -

SHEET 2 OF 6
SERVICE - TURBINE GLAND LEAKOFF
GROUP NO. 6450-0105-1002 SI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-702 SHEET 12 REV. D

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P7AR	2 1/2" IPS x STD THK PIPE-STL	PIPE DET 6450-844	PS	
		2		↓	1" ↓	↓	↓	
		3	1	P7AZ	2 1/2" CR-MOLY			
		4		↓	2" ↓	↓		
		5						
		6						
D		7	30' 0"	P11	1" ↓ STL	S/ 57-06-104	↓	
		8						
		9	1	F100	4" X 2.66" X 7.7# I-BEAM L= 48" STL	S/SY 73-08-204	PS	
		10	1	F101	3" x 3" x 3/8" x 7.2# ANGLE STL L=6'-0"	S/SY 73-05-246	↓	
D		11	1	F-21	SALINITY CELL	PO (168) 6755-C1	ST-PS	
		12						
		13						
		14	1	TR-2	2 1/2" TIE ROD	MO 283200 S-7 L-7	ST-PS	
		15	1	TR-3	2 1/2" ↓	MO 283 200 S-7 L-13	↓	
		16	1	SH-2	2 1/2" SPRING HGR	PO (120) 6552-C16	MD-PS	
		17						
		18						

REMARKS -

SHEET 3 OF 6
SERVICE - TURBINE GLAND LEAK-OFF
GROUP NO. 6450-0105-1002 SI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-702 SHEET 13 REV. D

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	8	H-12	1" STD HGR W/1/4" LINER	S/ 25-47-346	ST-PS	
		2	9	H-12	2 1/2"	S/ 25-47-386	↓	
		3	4	H-12	2 1/2" W/EX LEG	↓		
		4	1	H-12	4"	S/ 25-47-416		
		5	2	H-12	4" W/EX LEG	↓		
D		6	22	H-13	1"	S/ 25-48-346		
		7	1	H-13	1 1/2"	S/ 25-48-366		
		8	2	H-13	2"	S/ 25-48-376		
		9	5	H-13	3"	S/ 25-48-396		
		10	5	H-14	2 1/2"	S/ 25-49-386		
		11	1	H-14	3" ↓	S/ 25-49-396		
		12	1	RH-1	3 1/2" ROD HGR	MO 283 200 S-5 L-1		
		13	1	RH-2	3 1/2"	MO 283200 S-5 L-7		
		14	1	RH-3	3 1/2"	MO 283200 S-5 L-13		
		15	1	RH-4	2 1/2"	MO 283200 S-6 L-1		
		16	1	RH-5	3"	MO 283200 S-6 L-7		
		17	1	RH-6	4" ↓	MO 283200 S-6 L-13	↓	
		18						

REMARKS -

SH4 OF 6
SERVICE - TURBINE GLAND LEAKOFF
GROUP NO. 6450-0105-1002 SI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-702 SHEET 14 REV. D

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	V-8006	6" GATE V-FLGD-STL-150#	PO (48) 6451-M-3	MD-PS	1507
C		2	1	V-8013	2 1/2"	PO ㊲ 6451-M-3	↓	1515
C		3	1	V-8014	2 1/2"	PO ㊲ 6451-M-3		1516
C		4	1	V-8015	2 1/2"	PO ㊲ 6451-M-3		1517
C		5	1	V-8016	2 1/2"	PO ㊲ 6451-M-3		1518
C		6	1	V-8017	2 1/2" ↓	PO ㊲ 6451-M-3	↓	1519
		7						
		8						
		9	2	F-16	3 1/2" BACKING RING - STD - STL	S/97-18-128	ST-PS	
		10	5	F-4	4"	S/97-18-131	↓	
		11	5	F-5	3"	S/97-18-126		
		12	6	F-6	2 1/2" ↓	S/97-18-124	↓	
		13	8	F-12	1" 90° ELL-STL-SOC WELD-3000#	PO ⑦ 6951-C-3	MD-PS	
		14						
		15						
		16						
		17						
		18						

REMARKS -

SHEET 5 OF 6
SERVICE - TURBINE GLAND LEAKOFF
GROUP NO. 6450-0105-1002 SI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-702 SHEET 15 REV. C

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	16	Z2	6"	BOLTS	3/4" HVY HEX HD L=3 1/4"	PO 6000-C-7 ㉑	MD-PS	
	2	16			NUTS	3/4 HVY HEX	PO 6000-C-12 ⑭	↓	
	3	2			GSKT	1/16" ASBESTOS 150#STD	S/15-01-282	ST-PS	
	4	4	Z5	3"	BOLTS	5/8" HVY HEX HD L=3"	PO 6000-C-13 ㊾	MD-PS	
	5	4			NUTS	5/8" HVY HEX	PO 6000-C-12 ⑱	↓	
	6	1			GSKT	1/16" ASBESTOS 150#STD	S/15-01-274	ST-PS	
	7	40	Z6	2 1/2"	BOLTS	5/8" HVY HEX HD L=2 3/4"	PO 6000-C-13 ㊿	MD-PS	
	8	40			NUTS	5/8" HVY HEX	PO 6000-C-12 ⑱	↓	
	9	10			GSKT	1/16" ASBESTOS 150#STD	S/15-01-272	ST-PS	
	10	4	Z7	2"	BOLTS	5/8" HVY HEX HD L=2 1/2"	PO 6000-C-7 ㉗	MD-PS	
	11	4			NUTS	5/8" HVY HEX	PO 6000-C-12 ⑱	↓	
	12	1			GSKT	1/16" ASBESTOS 150#STD	S/15-01-270	ST-PS	
	13	16	Z8	1 1/2"	BOLTS	1/2" HVY HEX HD L=2 1/4"	PO 6000-C-13 ④	MD-PS	
	14	16			NUTS	1/2" HVY HEX	PO 6000-C-13 (52)	↓	
	15	4			GSKT	1/16" ASBESTOS 150#STD	S/15-01-268	ST-PS	
	16	4	Z9	1"	BOLTS	1/2" HVY HEX HD L=2"	PO 6000-C-7 ㉜	MD-PS	
	17	4			NUTS	1/2" HVY HEX	PO 6000-C-13 (52)	↓	
	18	1			GSKT	1/16 ASBESTOS 150#STD	S/15-01-264	ST-PS	
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22	4	Z13	3"	BOLTS	5/8" HVY-HEX HD L=1 7/8"	PO 6000-C-13 (51)	MD-PS	
	23	-			NUTS	-	-	↓	
	24	1			GSKT	1/16" ASBESTOS 150#STD	S/15-01-274	ST-PS	
	25	4	Z14	2"	BOLTS	5/8" HVY HEX HD L=2 1/2"	PO 6000-C-7 ㉗	MD-PS	
	26	4			NUTS	5/8" HVY HEX	PO 6000-C-12 ⑱	↓	
	27	1			GSKT	SPIRAL WOUND FLEX - 150#STD	S/97-54-060	ST-PS	
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SHEET 6 OF 6
SERVICE - TURBINE GLAND LEAKOFF
GROUP NO. 6450-0105-1002 SI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-702 SHEET 16 REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1						
		2						
		3	1	P3G	5" IPS x STD THK PIPE-STL	PIPE DET 6450-844	PS	
		4		↓	3 1/2"	↓	↓	
		5	1	P3H	5"			
		6	1	P4R	4"			
		7		↓	3"			
		8						
		9						
		10	1	P7BD	2 1/2"			
		11		↓	1 1/2"			
		12	1	P7BB	2 1/2"			
		13	1	P7BC	2 1/2"			
		-	1	P6AK	3"			
		15	1	P8BP	2"			
		16	1	P8BQ	2" ↓	↓	↓	
		17						
		18						

REMARKS -

SHEET 1 OF 4
SERVICE - TURBINE GLAND LEAKOFF
GROUP NO. 6450-0113-1105 SI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-702 SHEET 17 REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1						1504
		2						1506
C		3	1	V-8007	2 1/2" GATE V - FLG STL	PO ㊲ 6451-M-3	MD-PS	1508
		4						
		5	1	J-1	3/4" - 150# FLANGE - STL	PO ② 6450-M-2	MD-PS	
		6	1	J-2	1 1/2" - 150# FLG STL	PO ③ 6450-C-37	↓	
		7	3	F-3	5" BACKING RING-STD-STL	S/ 97-18-133	ST-PS	
		8	1	F-5	3" ↓	S/ 97-18-126	↓	
		9	2	F-7	2" COUPLING - SOC WELD 3000# STL	S/ 97-14-307		
		10	1	F-15	1 1/2" x 1" RED. COUP. 3000# SW	S/ 97-16-166		
		11	1	F-19	1" COUPLING STL 3000# SW	S/ 97-14-304	↓	
		12	1	F-20	3/4" 90° ELL SOC WELD-STL-3000#	PO ⑱ 6555-C-8	MD-PS	
		13	2	F-6	2 1/2" BACKING RING STL STD	S/ 97-18-124	ST-PS	
		14						
		15	6'	P-9	1 1/2" IPS x STD THK PIPE-STL	S/57-06-106	ST-PS	
		16	24'0"	P-11	1"	S/57-06-106	↓	
		17	10'6"	P-12	3/4" ↓	S/ 57-06-103	↓	
		18						

REMARKS -

SHEET 2 OF 4
SERVICE - TURBINE GLAND LEAKOFF
GROUP NO. 6450-0113-1105 SI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-702 SHEET 18 REV. C

6450-702

MICRO-MASTER® 105 mm

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SEPT. '80

FRAME

8X

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	2	H-12	3/4" STD HGR W/1/4" LINER	S/ 25-47-336	ST-PS	
		2	4	H-12	2" ↓	S/ 25-47-376	|	
		3	1	H-12	2 1/2" ↓	S/ 25-47-386	|	
		4	1	H-13	2 1/2" ↓	S/ 25-48-386	|	
		5	2	H-13	2 1/2" ↓ W/EX LEG	↓	|	
		6	1	H-14	3/4" ↓	S/ 25-49-336	|	
		7	1.	H-14	2" ↓	S/ 25-49-376	|	
		8	1	H-2	5" FIXED HGR	S/ 25-41-426	|	
		9	1	TR-4	2 1/2" TIE ROD	MO 283200 S-8L-1	↓	
		10	1	F100	I-BEAM STL 4" X 2.66" X 7.7# X 36" LG	S/SY 7308-204	PS	
		11	1	F102	3" PIPE CLAMP	S/2543-396	ST-PS	
		12	1	F103	8" PIPE CLAMP	S/ 25-43-446	↓	
		13	1	F104	3/4" IPS x "X" STR PIPE STL L = 36"	S/SY 57-07-103	PS	
		14						
		15						
		16						
		17						
		18						

REMARKS -

SH 3 OF 4

SERVICE - TURBINE GLAND LEAKOFF			GROUP NO.	6450-0113-1105 SI	
APPLICABLE HULLS	613C	614C	615C	DWG NO. 6450-702	SHEET 19	REV. A

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	8	Z3	4"	BOLTS	5/8" HVY HEX HD L=3"	PO 6000-C-13 ㊾	MD-PS	
	2	8			NUTS	5/8" HVY HEX	PO 6000-C-12 ⑱	|	
	3	1			GSKT	1/16" ASBESTOS 150#STD	S/15-01-278	ST-PS	
	4	8	Z4	3 1/2"	BOLTS	5/8" HVY HEX HD L= 3"	PO 6000-C-13 ㊾	MD-PS	
	5	8			NUTS	5/8" HVY HEX	PO 6000-C-12 ⑱	|	
	6	1			GSKT	1/16" ASBESTOS 150#STD	S/15-01-276	ST-PS	
	7	8	Z5	3"	BOLTS	5/8" HVY HEX HD L= 3"	PO 6000-C-13 ㊾	MD-PS	
	8	8			NUTS	5/8" HVY HEX	PO 6000-C-12 ⑱	|	
	9	2			GSKT	1/16" ASBESTOS 150#STD	S/15-01-274	ST-PS	
	10	8	Z6	2 1/2"	BOLTS	5/8" HVY HEX HD L=2 3/4"	PO 6000-C-13 ㊿	MD-PS	
	11	8			NUTS	5/8" HVY HEX	PO 6000-C-12 ⑱	|	
	12	2			GSKT	1/16" ASBESTOS 150#STD	S/15-01-272	ST-PS	
	13	8	Z8	1 1/2"	BOLTS	1/2" HVY HEX HD L=2 1/4"	PO 6000-C-13 ④	MD-PS	
	14	8			NUTS	1/2" HVY HEX	PO 6000-C-13 (52)	|	
	15	2			GSKT	1/16" ASBESTOS 150#STD	S/15-01-268	ST-PS	
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
C	22	4	Z12	3/4"	BOLTS	1/2" HVY HEX HD L= 2"	PO 6000-C7 ㉜	MD-PS	
	23	4			NUTS	1/2" HVY HEX	PO 6000-C13 (52)	|	
	24	1			GSKT	1/16" ASBESTOS 150#STD	S/15-01-262	ST-PS	
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SHEET 4 OF 4

SERVICE - TURBINE GLAND LEAKOFF			GROUP NO.	6450-0113-1105 SI		
APPLICABLE HULLS	613C	614C	615C	DWG NO. 6450-702	SHEET 20	REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3J	5" IPS x STD THK PIPE - STL	PIPE DETAIL 6450-844	PS	
		2	1	P3K	5" ↓	↓	|	
		3						
		4						
		5						
		6						
		7	2	F-3	5" BACKING RING - STD - STL	S/97-18-133	ST-PS	
		8	4	H-2	5" STD HGR	S/ 25-41-422	|	
		9	1	H-7	5" ↓	S/ 25-45-422	|	
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SHEET 1 OF 1

SERVICE - TURBINE GLAND LEAKOFF			GROUP NO.	6450-0119-1101 PI		
APPLICABLE HULLS	613C	614C	615C	DWG NO. 6450-702	SHEET 21	REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3L	5" IPS x STD THK PIPE - STL	PIPE DETAIL 6450-844	PS	
		2	1	P3M	5" ↓	↓	|	
		3	1	P3N	5" ↓	↓	|	
		4	1	P3P	5" ↓	↓	|	
		5	1	P3Q	5" ↓	↓	|	
		6	1	P8BS	2" ↓	↓	|	
		7	1	P8BT	2" ↓	↓	|	
		8	1	P8BR	2" ↓	↓	|	
		9	6"	P8	2" IPS x STD THK PIPE - STL 2" NPT THREAD ONE END	S/57-06-107	|	
		10						
		11						
C		12	1	V-8020	2" GSV - 600# SOC. W. STL	PIPE DETAIL 6450-844	PS	
C		13	1	V-8021	2" ↓	↓	↓	
		14	5	F-3	5" BACKING RING - STD - STL	S/97-18-133	ST-PS	
		15	2	F-7	2" COUPLING - STL 3000# SOC WELD	S/97-14-307	|	
		16	1	F-17	2" UNION - STL - 3000# SOC WELD	PO 6555-C-8 ㉔	MD-PS	
		17	1	F-18	3/16" DIA ORIFICE PLATE	PIPE DETAIL 6450-844	PS	
		18						

REMARKS -

SHEET 1 OF 2

SERVICE - TURBINE GLAND LEAKOFF			GROUP NO.	6450-1601-1001 PI		
APPLICABLE HULLS	613C	614C	615C	DWG NO. 6450-702	SHEET 22	REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	SH-4	2" SPRING HGR	PO (122) 6552-C16	MD-PS	
		2	1	SH-5	2" ↓	(123) ↓	↓	
		3	1	TR-1	2" TIE ROD	MO 283200 S-7L-1	ST-PS	
		4	1	H-2	5" STD HGR	S/ 25-41-422	|	
		5	4	H-7	5" ↓	S/ 25-45-422	|	
		6	2	H-14	2" ↓ W/1/4" LINER	S/ 25-49-376	|	
		7	4	H-12	2" ↓	S/ 25-47-376	↓	
		8						
E		9	1	F-22	DRAIN POT	MO 216707 59 L.11	ST-PS	
↓		10	1	F-23	DRAIN POT COVER	MO 216707 59 L7	|	
↓		11	2	F-24	2" ELL 90° SW STL 3000#	S/ 25-60-011	|	
↓		12	90'-0"	P-11	1" IPS x STD THK PIPE STL	S/ 57-06-104	|	
↓		13	2'-0"	P-8	2" IPS x STD THK PIPE STL	S/57-06-107	|	
↓		14	9	F-25	1" COUPLINGS STL S.W. 3000#	S/ 97-14-304	|	
↓		15	9	H-11	1" SWING TYPE HGR W/LINER	S/ 25-46-346	↓	
		16						
		17						
		18						

REMARKS -

PS=170 SHT 2 OF 2

SERVICE - TURBINE GLAND LEAKOFF			GROUP NO.	6450-1601-1001 PI		
APPLICABLE HULLS	613C	614C	615C	DWG NO. 6450-702	SHEET 23	REV. E

6450-702

MICRO-MASTER® 105 mm

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ARLINGTON • WASHINGTON • BETHESDA
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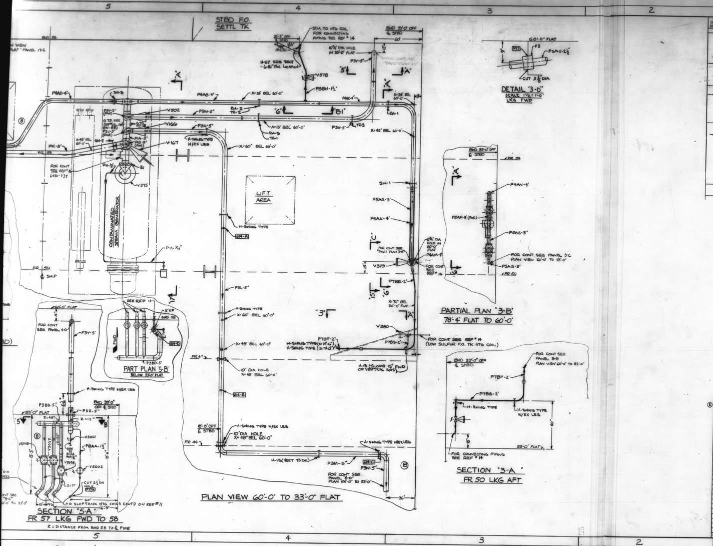
SEPT. '80

FRAME

8X


STBD F.O. SETTL TK
STM TO HTG COIL FOR CONNECTING PIPING SEE REF # 14
BHD 39'-0" OFF ℄ STBD
DETAIL '3-D'
SCALE 1½" = 1'-0"
LKG FWD
60'-0" FLAT
P3Y-5"
P4AD-4"
P4AB-4"
P3N-5"
P3K-5"
P4AC-4"
V502
V166
V-167
V375
V378
P8BH-1½"
X=25' BEL 60'-0"
X=15' BEL 60'-0"
X=42' BEL 60'-0"
X=60" BEL 60'-0"
X=48" BEL 60'-0"
H-SWING TYPE
H-SWING TYPE W/EX LEG
CONTAMINATED STEAM GENERATOR
P11-¼"
FR 50
℄ SHIP
LIFT AREA
SH-1
P5AR-3"
P4AK-4"
P3L-5"
V379
P7BE-2"
V380
P7BF-2"
P7BG-2"
FOR CONT SEE REF # 14 (LOW SULFUR F.O. TK HTG COIL)
H-13 (SLOPE 15° FWD OF VERTICAL AXIS)
10" DIA HOLE X=48" BEL 60'-0"
FR 47
FR 44
18'-9" OFF ℄ STBD
G14-A
G14-B
G14-C
P3M-5"
FOR CONT SEE PANEL 8-D PLAN 106'-0" TO 33'-0"
PARTIAL PLAN "3-B"
78'-4" FLAT TO 60'-0"
P4AN-4"
P5AR-3" (PAR)
P5AS-3"
P5AG-3"
FOR CONT SEE PANEL 3-C PLAN VIEW 60'-0" TO 33'-0"
BHD 33'-0" OFF ℄ STBD
FR 54
FR 50
SECTION "3-A"
FR 50 LKG AFT
FOR CONNECTING PIPING SEE REF # 14
33'-0" FLAT
PART PLAN '5-B'
BELOW 33'-0" FLAT
P3BD-5"
SEE REF 11
SECTION '5-A'
FR 57 LKG FWD TO 58
Z = DISTANCE FROM BHD 58 TO ℄ PIPE
TO SLOPTANK HTG COILS CONT'D ON REF # 11
P8AA-1½"
V5061
V5002
V5003
V5013
P32-5"
PLAN VIEW 60'-0" TO 33'-0" FLAT

NN CHANGE ORDER No	REV	ZONE	DESCRIPTION	NNS&DDCO DATE	NNS&DDCO AUTHO	OWNER DATE	OWNER APPD
—	A	—	INITIAL ISSUE.	12/19/75		—	—
TO JRL 7-6-76	B	7D 14C 15C 4A 8D	DESIGN DEVELOPMENT: ALT'D STEAM TO PORT AND STBD F.O. STORAGE TANKS P4AF, P4AG, P4AH, P4AJ, P4AL & P4AM. ALT'D P3P-5" & P3M-5" TO CLEAR STRUCTURE @ FR 41. ALT'D P3Q-5" AND HOLE CUTS IN FR 35 & 38. RBW				
		12A 12C	ALT'D P3R-5", P3S-5", P3T-5" & P3L-5" DELETED P3U-5" RBW				
		5-D 6-D 11-D	ALT'D RUN P4AD-4", P4AE-4", & P8AV-2½".				
		5-A	ALT'D SECTION '5-A' FR57 LKG FWD TO FR 58	6/1/77		—	—
	C	17-A 5C	ADDED SENSING LINE CONN FOR CONTAMINATED STEAM GEN TEMP CONTROL				
		3D	ADDED DET 3-D				
		1A 17-A	ADDED REF # 22 ADDED ¾" BOSS FOR T-42			—	—
—	D	5B	PLAN VIEW 106'-0" FLAT TO 33'-0" FLAT; ALT'D LOCATION OF BURNER TIP V158 ELEV 9'-0" ALT'D TO SUIT				
		17-A	ELEV '17-A' ADDED ½" TEST CONN TO P3J & P1B. (WORK ACCOMP ON G13C BY LR WBC-3HJ-15)				
		18-A	ADDED STEAM & WATER PIPING FOR CLEANING OF THE SEWAGE HOLDING TK LAM				
		5A 5B	ALT'D DET P3BD-5" & ADDED PART PLAN 5-B LAM				
		1A	ADDED REF 23, 24, 25 & 26 LAM				
			WORK ACCOMP ON H-613C			—	—
	E	—	ADDED WELD JOINT NUMBERS FOR G14C ONLY ADDED NOTE # 18 + REF # 27	1/5/79		—	—

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN IS DEVELOPED IN ACCORDANCE WITH REFERENCE Nº 1 & 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE US COAST GUARD AND ABS. FOR ADDITIONAL INFORMATION ON MATERIAL SEE REFERENCE # 2.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE US COAST GUARD, ABS AND REF 5.
4. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS: BUTT WELDS TYPE P-3, SOCKET WELDS TYPE P-14 AND FLANGE WELDS TYPE P-16A ON REF 5 EXCEPT AS OTHERWISE INDICATED.
5. BACKING RINGS AND COUPLINGS LISTED IN MATERIAL LIST ARE TO BE USED AS REQUIRED.
6. PIPE SIZES SPECIFIED ARE NOMINAL IRON PIPE SIZES.
7. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF PUMPS, HEAT EXCHANGERS, ETC.
8. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN. ALL BENDING RADII SHALL BE 5 TIMES THE NOMINAL DIAMETER.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REFERENCE 4.
10. TESTS ARE TO BE IN ACCORDANCE WITH REF. 2.
11. PAINTING IS TO BE IN ACCORDANCE WITH REF. 6.
12. INSULATION AND LAGGING SHALL BE IN ACCORDANCE WITH REF 8.
13. ALL HOLE CUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.
14. HANGERS AND TIE RODS INDICATED ON PLAN ARE TO BE INSTALLED WITHIN 6" OF POSITION SHOWN. ADDITIONAL HANGERS LISTED IN LIST OF MATERIAL ARE TO BE USED AS REQUIRED TO SUPPORT PIPING IN ACCORDANCE WITH REFERENCE 7.
15. "X" DIMENSIONS AS SHOWN ARE TAKEN FROM ℄ OF PIPE TO UNDERSIDE OF DECK ABOVE. "Y" DIMENSIONS AS SHOWN ARE TAKEN FROM ℄ OF PIPE TO NEAR SIDE OF DECK BELOW.
16. ALL PIPING ON THIS ARRANGEMENT IS CLASS I
17. FOR INSTALLATION OF SPECIAL HANGERS (SH, RH & TR) SEE REFERENCE NO. 20.
18. Ⓔ WELD JOINTS MARKED THUS G14- ARE TO BE RADIOGRAPHED FOR G14C ONLY IN ACCORDANCE WITH REF # 27.

FOR LIST OF MATERIAL SEE NN DWG 6450-704

NO.	REFERENCES	DWG NO.
Ⓔ 27	WELD INDEX TABULATION FOR MISC PIPING SYS (G14C ONLY)	283301
26	DIAG - MN & AUX SEA WATER CIRC SYS - ARR	6550-361
25	DIAG - MN & AUX SEA WATER CIRC SYS - LIST	6550-360
24	PP ARR SW COOLING FOR EQUIP ABV 33'-0" FLAT	6550-431
23	PIPING INSIDE SEWAGE HOLDING TK	2300-2275
22	PP ARR MISC INST IN ER	6755-67
21	PIPING ARR BOILER PRESS AUX STM - P.S. & E	6450-737
20	PIPE HANGERS - 220 PSI CONTAM STM - E.R.	6450-761
19	PIPING ARR REL VLV ESC ENG RM, PLAN, SECT & ELEV	6451-464
18	ARR FL PLTS, GRTG & LAD 60'-0" TO 78'-4" FLAT, E.R.	6650-236
17	(C.E.) ARR OF EXTERNAL CONN, FRONT, BOILER	[illegible]
16	PIPING ARR RED PRESS STM ENG RM - PLAN	6450-688
15	PIPING ARR CONTAMINATED STM DRAIN SYS - ENG RM	6555-469
14	HEATING COILS IN FUEL OIL TANKS - ARR	6351-122
13	PIPING ARR STEERING GEAR RM	[illegible]
12	PIPING ARR HEATING STM SYS - ENG RM	2652-262
11	STM, EXH, LAD & GRTG IN AFT PUMP ROOM ARR	6450-679
10	FM DECK PIPING FR 58 - 69 ARR	2400-361
9	PIPING ARR 125 PSI CONTAM STM SYS - E.R.	6450-743
8	DIRECTIONS FOR INSULATING & LAGGING PIPES & AUX	257322
7	STANDARD PIPE HANGERS	257056
6	PAINTING SCHEDULE	8300-40
5	FAB. & WELDING INSTRUCTIONS FOR CL I & II PIPING SYS	257035
4	TYP ARR OF GAGE PIPING	6750-481
3	LIST OF PRESSURE & VAC GAGES FURN BY SHIPYARD	6750-483
2	DIAGRAM CONTAMINATED STEAM GEN SYS - LIST	6450-693
1	DIAGRAM CONTAMINATED STEAM GEN SYS - ARR	6450-692

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS
OWNERS
ABS
USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT
FSCM NO. 43689

INSTALLATION GROUPS: 6450-0115-1002 SI
6450-0115-1001 PI
6450-0113-1001 PI
6450-0114-1001 PI
6450-0118-1001 SI
PIPE DETAIL - 6450-705

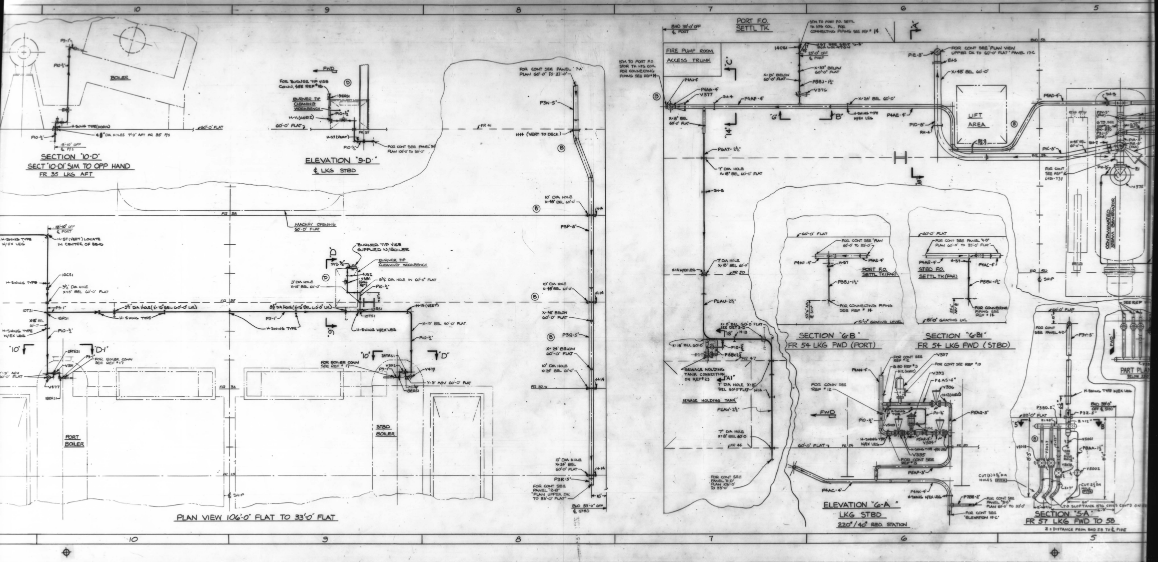
SCALE ½" = 1 FT
DRAWN R.B. WEISS
CHECKED T.E. SEAMAN
SECT MGR J.H. Johnson
DATE COMPL 12-19-75
EXAMINED
AUTHORIZED
DATE 12-19-75
TECH APPROVAL
CSD APPROVAL

PIPING ARRANGEMENT
220 PSI CONTAMINATED STM SYS
ENG RM - PLAN, SECT & ELEV

USMA DESIGN TII-S-116A
USMA DWG NO.
HULL NO.
DWG NO. 6450-703
REV E
SHEET NO. 1 OF 1

6450.703

MICRO-MASTER 105 mm
K+E
SEPT. '80
FRAME 1
10X


SECTION "10-D"
SECT '10-D1' SIM TO OPP HAND
FR 35 LKG AFT
BOILER
H-SWING TYPE (HORIZ)
60'-0" FLAT
ELEVATION "9-D"
℄ LKG STBD
FOR BURNER TIP VISE CONN, SEE REF # 18
BURNER TIP CLEANING WORKBENCH
FWD
FOR CONT SEE PANEL "7-A" PLAN 60'-0" TO 33'-0"
P3N-5"
H-14 (VERT TO DECK)
FR 41
FR 38
MACH'Y OPENING 60'-0" FLAT
P3P-5"
P3Q-5"
P3R-5"
FOR CONT SEE PANEL "12-B" "PLAN UPPER DK TO 33'-0" FLAT"
BHD 33'-0" OFF ℄ STBD
BURNER TIP VISE SUPPLIED W/BOILER
BURNER TIP CLEANING WORKBENCH
FOR BOILER CONN SEE REF # 17
PORT BOILER
STBD BOILER
℄ SHIP
PLAN VIEW 106'-0" FLAT TO 33'-0" FLAT
PORT F.O. SETTL TK
BHD 33'-0" OFF ℄ PORT
STM TO PORT F.O. SETTL TK HTG COIL. FOR CONNECTING PIPING SEE REF # 14
FIRE PUMP ROOM ACCESS TRUNK
STM TO PORT F.O. STOR TK HTG COIL FOR CONNECTING PIPING SEE REF # 14
FOR CONT SEE PLAN VIEW UPPER DK TO 60'-0" FLAT PANEL 17-C
LIFT AREA
P4AF-4"
P4AE-4"
P6AT-2½"
P6AU-2½"
P6AV-2½"
SEWAGE HOLDING TANK CONNECTION ON REF # 23
SEWAGE HOLDING TANK
FOR CONT SEE PANEL "11-D" PLAN 106'-0" TO 33'-0"
FR 44
FR 47
FR 50
SECTION "6-B"
FR 54 LKG FWD (PORT)
PORT F.O. SETTL TK (FAR)
SECTION "6-B1"
FR 54 LKG FWD (STBD)
STBD F.O. SETTL TK (FAR)
51'-0" GRATING LEVEL
ELEVATION "6-A"
LKG STBD
220#/40# RED. STATION
P5AQ-3"
P5AP-3"
P4AC-4"
P7BE-2"
FOR CONT SEE "ELEVATION 15-C"
CONTAMINATED STEAM GENERATOR
PART PLAN
SECTION "5-A"
FR 57 LKG FWD TO 58
Z = DISTANCE FROM BHD 58 TO ℄ PIPE
TO SLOPTANK HTG COILS CONT'D ON
10
9
8
7
6
5

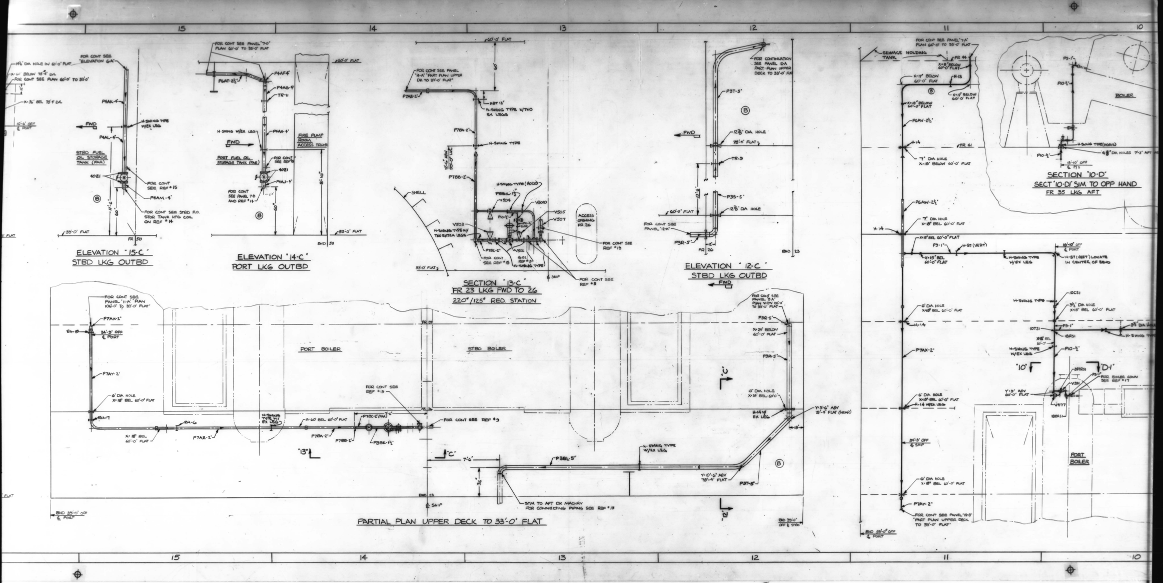
6450.703

MICRO-MASTER 105 mm

SEPT. '80

10X

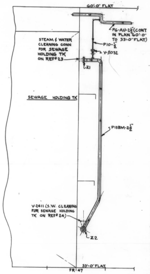
FRAME 2


15
14
13
12
11
10
ELEVATION "15-C"
STBD LKG OUTBD
STBD FUEL OIL STORAGE TANK (FAR)
FWD
FOR CONT SEE "ELEVATION 6-A"
P4AK-4"
P4AL-4"
P4AM-4"
H-SWING TYPE W/EX LEG
FOR CONT SEE REF #15
FOR CONT SEE STBD F.O. STOR TANK HTG COIL ON REF #14
33'-0" FLAT
FR 50
ELEVATION "14-C"
PORT LKG OUTBD
PORT FUEL OIL STORAGE TANK (FAR)
FOR CONT SEE PANEL "7-D" PLAN 60'-0" TO 33'-0" FLAT
P4AF-4"
P4AG-4"
P4AH-4"
P4AJ-4"
TR-11
H-SWING W/EX LEG
FIRE PUMP ROOM ACCESS TRUNK
60'-0" FLAT
33'-0" FLAT
BHD 50
SECTION "13-C"
FR 23 LKG FWD TO 26
220#/125# RED. STATION
60'-0" FLAT
FOR CONT SEE PANEL "14-A" PART PLAN UPPER DK TO 33'-0" FLAT
P7AZ-2"
P7BA-2"
P7BB-2"
P7BC-2"
P8BK-1½"
H-SWING TYPE W/TWO EX LEGS
H-SWING TYPE
H-SWING TYPE (HORIZ)
V503
V504
V505
V506
V507
V5010
SHELL
ACCESS OPENING FR 26
FOR CONT SEE REF #13
FOR CONT SEE REF #9
FOR CONT SEE REF #15
33'-0" FLAT
℄ SHIP
ELEVATION "12-C"
STBD LKG OUTBD
FWD
FOR CONTINUATION SEE PANEL 12-A PART PLAN UPPER DECK TO 33'-0" FLAT
P3T-5"
P3S-5"
P3R-5"
TR-3
12⅞" DIA HOLE
78'-4" FLAT
60'-0" FLAT
FOR CONT SEE PANEL "12-A"
FR 26
BHD 23
SEWAGE HOLDING TANK
FOR CONT SEE PANEL "7-A" PLAN 60'-0" TO 33'-0" FLAT
FR 44
FR 41
H-13
H-14
P6AV-2½"
P6AW-2½"
7" DIA HOLE
X-18" BEL 60'-0" FLAT
H-57 (VERT)
H-SWING TYPE W/EX LEG
P7AX-2"
P7AY-2"
6" DIA HOLE
FOR CONT SEE PANEL "15-B" PART PLAN UPPER DECK TO 33'-0" FLAT
SECTION "10-D"
SECT "10-D1" SIM TO OPP HAND
FR 35 LKG AFT
BOILER
P3-1"
P10-½"
H-SWING TYPE (HORIZ)
"10"
"D-1"
FOR BOILER CONN SEE REF #17
PORT BOILER
BHD 33'-0" OFF ℄ PORT
PARTIAL PLAN UPPER DECK TO 33'-0" FLAT
PORT BOILER
STBD BOILER
FOR CONT SEE PANEL "11-A" PLAN 106'-0" TO 33'-0" FLAT
P7AX-2"
P7AY-2"
P7AZ-2"
P7BA-2"
P7BB-2"
P7BC-2" (FAR)
P8BK-1½"
34'-3" OFF ℄ PORT
6" DIA HOLE X-18" BEL 60'-0" FLAT
FOR CONT SEE REF #13
FOR CONT SEE REF #9
"13"
"C"
P3BL-5"
P3T-5"
P3Q-5"
P3R-5"
H-SWING TYPE W/EX LEG
Y-10'-6" ABV 78'-4" FLAT
10" DIA HOLE
STM TO AFT DK MACHRY FOR CONNECTING PIPING SEE REF #13
"12"
BHD 23
℄ SHIP
BHD 33'-0" OFF ℄ STBD

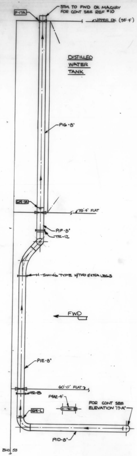
6450.703

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

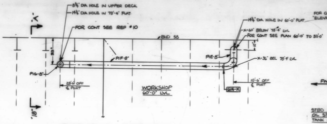
SEPT. '80
FRAME 3
10X


60'-0" FLAT
PG-AU-2½"(CONT IN PLAN 60'-0" TO 33'-0" FLAT)
STEAM & WATER CLEANING CONN FOR SEWAGE HOLDING TK ON REF# 23
P10-½"
V-5032
Z1
SEWAGE HOLDING TK
P13BM-2½"
V-2411 (S.W. CLEANING FOR SEWAGE HOLDING TK ON REF# 24)
Z2
33'-0" FLAT
FR 47

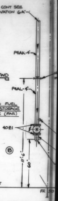
PART ELEV 18-A1
LKG OUTBD
FWD


P-17A
STM TO FWD DK MACHRY FOR CONT SEE REF #10
UPPER DK (98'-4")
DISTILLED WATER TANK
P1G-8"
G14-M
78'-4" FLAT
P1F-8"
TR-12
H-SWING TYPE W/TWO EXTRA LEGS
FWD
P1E-8"
60'-0" FLAT
TR-8
P4AE-4"
FOR CONT SEE ELEVATION "17-A"
G14-L
P1D-8"
BHD 58

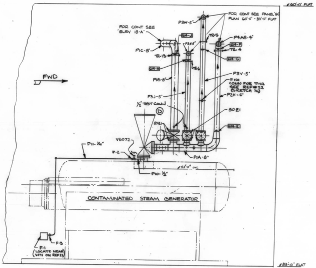
ELEVATION "18-A"
PORT LKG INBOARD


8¾" DIA HOLE IN UPPER DECK
14¾" DIA HOLE IN 78'-4" FLAT
"A"
FOR CONT SEE REF #10
BHD 58
33"
P1F-8"
P1G-8"
28'-0" OFF ℄ PORT
"18"
WORKSHOP 60'-0" LVL
14¾" DIA HOLE IN 60'-0" FLAT
X=60" BELOW 78'-4" LVL
FOR CONT SEE PLAN 60'-0" TO 33'-0"
12"
P1E-8"
X=36" BEL 78'-4" LVL
10'-6" OFF ℄ PORT
G14-K

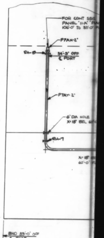
PART PLAN UPPER DECK TO 60'-0' FLAT


FOR CONT SEE "ELEVATION 6A"
P4AK-4"
FWD
P4AL-4"
STBD FUEL OIL STORAGE TANK (FAR)
40Z1
B
11'-6"
60"
33'-0" FLAT
FR 50

ELEVATION "15-C
STBD LKG OUTB


60'-0" FLAT
FOR CONT SEE PANEL 'SC PLAN 60'-0" - 33'-0" FLAT
P3W-5"
FOR CONT SEE "ELEV 18-A"
G14-J
TR-5
P4AB-4"
G14-F
TR-4
P3K-5"
P1C-8"
TR-13
G14-G
G14-H
TR-6
FWD
P1B-8"
P3V-5"
F101 CONN FOR T-42 SEE REF#22 (SKETCH 76)
P3J-5"
P2H-6"
½" TEST CONN
D
50Z1
80Z1
G14-E
V5072
P11-¼"
F-2
P1A-8"
43'-0" LVL
P10-½"
CONTAMINATED STEAM GENERATOR
F-3
F-1 (LOCATE NEAR V471 ON REF21)
33'-0" FLAT
BHD 58

ELEVATION "17-A"
STBD LKG TO ℄


FOR CONT SEE PANEL "11-A" PLAN 106'-0" TO 33'-0"
P7AX-2"
R4-8
34'-9" OFF ℄ PORT
P7AY-2"
6" DIA HOLE X=18" BEL 60'-0"
R4-7
X=18" BEL 60'-0"
BHD 33'-0" OFF ℄ PORT

6450.703

SEPT. '80
FRAME 4
10X

6450-704

CSD VAULT
X163

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 1-8-9
SIGNED J.K. Johnson

YARD PRINTS
ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS																				
REV.	E	E	A	D	B	D	B	E	B	A	C	A	B	4	A	B	B	A	C	4A
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	D

GROUP
MC NO.

	614C	613C
NNS&DDCO HULL No.	310	309

MARAD HULL No.: T11-S-116A
USMA DESIGN
SHIP'S NAME

DWG. REV. — HULL APPLIC.	613C	614C
A	YES	YES
B	YES	YES
C	YES	YES
D	YES	YES
E	YES	YES

APPROVALS
OWNERS
ABS
USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP DESIGN DEPARTMENT

FOR PIPING ARRANGEMENT SEE DWG 6450-703
PIPE DETAIL 6450-705
INSTALLATION GROUP 6450-0115-1002 SI
6450-0115-1001 PI, 6450-0113-1001 PI,
6450-0114-1001 PI, 6450-0118-1001 SI

SCALE NONE
DRAWN R.B. WEISS
CHECKED T.E. SEAMAN
SECT. MGR. J.K. Johnson
DATE COMPL. 12-19-75
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 12-19-75
TECH. APPROVAL
CSD APPROVAL R.L. Harrington

GROUPED BY CHK.
DATES COMP. PART
HULL 613C GROUP NO. KEY
TYPE OF DWG.

TITLE PIPING ARR - 220 PSI CONTAMINATED STM SYS ENG RM LIST OF MATERIAL

DWG. NO. 6450-704 REV E SHEET NO. 1 OF 13

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D.	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE. RJP	12/19/75		–	–
B	1,2,3,4 11,13,16 19	S/M FOR HANGERS ALTD	8/2/7		–	–
C	6 11 19	ADDED L.7 ADDED L.10 ADDED L.14				
	8	ALTERED LINE 3; WAS 7'-6" ADDED LINES 4,5,6,7, 8, 29				
	4	ADDED LINE 17				
D	5	ADDED HOT LOADS & VERT MOVE TO L'S 6 THRU 10				
	4 4A	ADDED LINES 3,4 & 11 SHT 4A LAM	10/16/8			
		WORK ACCOMP ON 613C				
E	8	ADDED LINES 10-15	1/8-9			

GENERAL NOTES

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF #1.

NO.	REFERENCES	DWG. NO.
2.	PIPING ARR 220 PSI CONTAM STM SYS ENG RM PLAN, SECT, ELEV	6450-703
1.	DIAGRAM CONTAMINATED STEAM GEN SYSTEM - LIST	6450-693

HULL NO. 613C, 614C DWG. NO. 6450-704 SHEET 2 OF –

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1C	8" IPS X STD THK PIPE STEEL	PIPE DETAIL 6450-705	PS	
		2	1	P1D				
		3	1	P3K	5" IPS			
		4	1	P3L				
		5	1	P3W				
		6	1	P3X				
		7	1	P4AB	4" IPS			
		8	1	P4AC				
		9	1	P4AD				
		10	1	P4AE				
		11	1	P4AF				
	ASSY NO 1	12	1	P4AN				
		13	1	P5AP	3" IPS			
		14	1	P5AQ				
		15	1	P5AR				
	ASSY NO 1	16	1	P4AS	4" IPS			
		17	6"	P10	1/2" IPS X"X" HVY THK	ON PIPE DET 6450-705		
		18						

REMARKS –

SERVICE - 220 PSI CONTAM STM SYS - ENG RM
GROUP NO. 6450-0115-1001 PI SHT 1 OF 5
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 3 REV. A

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P6AT	2½" IPS X STD THK PIPE STEEL	PIPE DETAIL 6450-705	PS	
		2	1	P6AU				
D		3	1	P13BM	X-STR			
D		4	72"	P10	1/2" IPS	S 57-07-102		
	ASSY NO 1	5	1	V393	1½ PRESS RED 150# FLG STL	ON PIPE DET 6450-705	PS	
		6	1	V394	3" GLOBE STOP			
		7	1	V395	3" GATE			
		8	1	V396	3" GLOBE STOP			
		9	1	V5009	1/2 GLOBE STOP 600# S.W. STL			
		10	1	V397	4"X6" ANGLE RELIEF 300#/150# FLG STL (SET AT 50PSIG)			
D		11	1	V5032	1/2 GL STOP VALVE, SW, 600#, STL	PO ② 6450-C29		
		12	1	80WS1	8" BACKING RING STL (STD)	97-18-137	ST-PS	
		13	3	50WS1	5"	97-18-133		
		14	5	40WS1	4"	97-18-131		
		15	2	30WS1	3"	97-18-126		
		16	2	24WS1	2½"	97-18-124		
C		17	1	F4	5" IPS x STD THK PIPE STL	S 57-06-113		
		18						

REMARKS –

SERVICE - 220 PSI CONTAM STM SYS - ENG RM
GROUP NO. 6450-0115-1001 PI SHT 2 OF 5
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 4 REV. D

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	4	Z1	3"	BOLTS	5/8 A307 GR B ZINC PLATED HVY HEX L=3"	PO 2600-C10 ㉓		
	2	4			NUTS	5/8 HVY HEX ZINC PLATED	PO 6000-C12 ⑱		
	3	1			GSKT	1/16 COMPRESS ASBESTOS	15-01-274		
	4	4	Z2	2½"	BOLTS	5/8 A307 GR B ZINC PLATED HVY HEX L=2½	6000-C7 ㉗		
	5	4			NUTS	5/8 HVY HEX ZINC PLATED	6000-C12 ⑱		
	6	1			GSKT	1/16 COMPRESS ASBESTOS	15-01-270		
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –

SERVICE –
GROUP NO. 6450-0115-1001 PI SHT 3 OF 5
APPLICABLE HULLS 613 614
DWG NO. 6450-704 SHEET 4A REV. D

INSTALLATION GROUP

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	TR-1	5" TIE ROD ASSY B=3⅜"	MO 257726 S.1 L.1	ST-PS	
		2	1	TR-2	4" TIE ROD ASSY L=42"	MO 257726 S.1 L.4		
		3	1	TR-3	5" TIE ROD ASSY L=45"	MO 257726 S.1 L.10		
		4	1	TR-5	5" TIE ROD ASSY L=57"(2) C=60°	MO 257726 S.4 L.7		
		5	1	TR-7	4" TIE ROD ASSY L=42"	MO 257726 S.1 L.4		
D		6	1	SH-1	SIZE 4" HOT LOAD 135 VERT MOVE COLD-HOT .28" UP	PO ㉓ 6552-C16	MD-PS	
		7	1	SH-2	8" 1082 .47" UP	㉔		
		8	1	SH-3	4" 594 .48" UP	㉕		
		9	1	SH-4	4" 155 .51" UP	㉖		
		10	1	SH-5	2½" 66 .35" UP	㉗		
		11	2	H-11	5" SWING TYPE HGR W/ 1/4" LINER	S 25-46-426	ST-PS	
		12	1	H-11	5" SWING TYPE HGR W/EX LEG W/1/4" LINER	MO 257320 S.9 L.1	BN-PS	
		13	1	H-11	3" SWING TYPE HGR W/EX LEG W/1/4" LINER	S 25-46-396	ST-PS	
		14	2	H-11	4" SWING TYPE HGR W/EX LEG, W/1/4" LINER	S 25-46-416		
		15	2	H-12	3" SWING TYPE HGR W/1/4" LINER	S 25-47-396		
		16	1	H-14	2½" SWING TYPE HGR W/EX LEG W/1/4" LINER	S 25-49-386		
		17	1	H-14	2½" SWING TYPE HGR W/ 1/4" LINER			
		18	1	RH-1	4" ROD TYPE HGR B=3⅜"	MO 257726 S.2 L.1	BN-PS	

REMARKS –

SERVICE - 220 PSI CONTAM STM SYS - ER
GROUP NO. 6450-0115-1001-PI SHT 4 OF 5
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 5 REV. D

INSTALLATION GROUP

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	RH-2	4" ROD TYPE HGR B=3⅜"	MO 257726 S.2 L.1	BN-PS	
		2	1	RH-3	4" ROD TYPE HGR B=3⅜"	MO 257726 S.2 L.1		
		3	1	RH-4	8" ROD TYPE HGR L=44"	MO 257726 S.2 L.4		
		4	1	RH-5	8" ROD TYPE HGR L=44"	MO 257726 S.2 L.4		
		5	1	RH-9	5" ROD TYPE HGR B=6" (2)	MO 257726 S.2 L.10		
		6	1	H13	2½" SWING TYPE HGR W/1/4" LINER	MO 257320 S.9 L.9		
C		7	2'	F-100	3x3x3/8" L STL	MO 257726 S.3 L.14		
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE - 220 PSI CONTAM STM SYS-ER
GROUP NO. 6450-0115-1001 PI SHT 5 OF 5
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 6 REV. C

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1A	8" IPS X STD THK PIPE STL	PIPE DETAIL 6450-705	PS	
		2	1	P1B				
		3	1	P2H	6" IPS			
		4	1	P3J	5" IPS			
		5	1	P3V				
		6	1	P3Y				
		7	1	P3Z				
		8	1	P8AA	1½"			
		9	1	P4AK	4" IPS			
		10	1	P4AL				
		11	1	P4AM				
		12	1	P4AG				
		13	1	P4AH				
		14	1	P4AJ				
		15	1	P3BD	5" IPS			
		16	1	P7BE	2"			
		17	1	P7BF				
		18	1	P7BG				

REMARKS –

SERVICE - 220 PSI CONTAM STM SYS - E.R.
GROUP NO. 6450-0115-1002 SI SHT 1 OF
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 7 REV. B

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P8BH	1½" IPS X STD THK PIPE STEEL	PIPE DETAIL 6450-705	PS	
		2	1	P8BJ			PS	
C		3	1'6"	P11	1/4" IPS X"X" HVY THK PIPE STEEL	S 57-07-100	PS	
C		4	12"	P10	1/2"	S 57-07-102	ST-PS	
C		5	1	F-1	CONTROL AIR PILOT FOR V-171 ON 6450-737	PO (17-C) 6450-M10		
C		6	1	F-2	1/2"x1/4" INSERT RED STL	PO (41) 6200-M12		
C		7	1	F-3	1/4" UNION THD MI 300#	S 25-12-160		
C		8	1	V5072	1/2" GLOBE STOP VLV SW STL 600#	S 26-09-275		
C		9	1	F101	3/4" SW BOSS STL	S 25-02-221		
E		10	1	V459	2" GLOBE STOP STL 600# SW (LOCKED CLOSED)	FURN ON CONTAM ST GEN. MODULE	ST-PS	
		11	1	V-470	1" GLOBE STOP CHECK 600# SW (LOCKED OPEN)			
		12	1	V-469				
		13	1	V-531				
		14	3	F-5	LOCKING DEVICE (LOCKED OPEN) ASSY (99) 283131	MO 283173 S.5 L.1		
		15	1	F-6	LOCKING DEVICE (LOCKED CLOSED) ASSY (99) 283131			
		16						
		17						
		18						

REMARKS –

SERVICE - 220 PSI CONTAM STM SYS-ER
GROUP NO. 6450-0115-1002 SI SHT 2 OF
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 8 REV. E

6450-704

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80
FRAME
8X

6450-704

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ALEXANDRIA • RICHMOND • NORFOLK
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SEPT. '80
FRAME
8X

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V166	5" GATE 150# FLG STL	PO ㊳ 6451-M3	MD-PS	
		2	1	V167	8" ↓	↓ ㊷	↓	
		3	1	V375	8" ANGLE STOP CHK 300# FLG STL	PART OF ④ 6402-C2	↓	
		4	1	V376	1½" GLOBE STOP SW 600# STL	ON PIPE DET 6450-705	PS	
		5	1	V377	4" GLOBE STOP 150# FLG STL	PO ⑱ 6450-M4	MD-PS	
		6	1	V378	1½" GLOBE STOP 600# SW STL	ON PIPE DET 6450-705	PS	
		7	1	V379	4" GLOBE STOP 150# FLG STL	PO ⑱ 6450-M4	MD-PS	
		8	1	V380	2" GLOBE STOP 600# SW STL	ON PIPE DET 6450-705	PS	
		9	1	V502	5" GATE 150# FLG STL	PO ㊳ 6451-M3	MD-PS	
		10	1	V5002	2" GLOBE STOP 600# S.W. STL	ON PIPE DET 6450-705	PS	
		11	1 1 1	V5003 V5037 V5038	3" GLOBE STOP 150# FLG STL	↓	↓	
		12	1	2US2	¼" UNION SCR'D STEEL	PO ㊸ 6200-M12	MD-PS	
		13	1	80WS1	8" BACKING RING STL (STD)	97-18-137	ST-PS	
		14	2	60WS1	6" ↓	25-20-946	↓	
		15	4	50WS1	5" ↓	97-18-133	↓	
		16	6	40WS1	4" ↓	97-18-131	↓	
		17	1	20ES1	2" ELL 90° S.W. 3000# STL	PO ⑧ 6200-M12	MD-PS	
		18	2	14CS1	1½" COUPLING S.W. 3000# STL	↓ ⑳	↓	

REMARKS –

SERVICE – 220 PSI CONTAM STM SYS - ER
GROUP NO.
6450-0115-1002 SI
SHT 3 OF
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 9 REV. B

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	12			BOLTS	7/8" HVY HEX HEAD L=4½"	6000-C7 (55)	MD-PS	
	2	12	21	8"	NUTS	7/8" HVY HEX	6000-C11 ④	↓	
	3	1			GSKT	1/16" COMP ASBESTOS	15-01-284 E	ST-PS	
	4	16			BOLTS	3/4" HVY HEX HEAD L=3½"	6000-C7 ㉚	MD-PS	
	5	16	8021	8"	NUTS	3/4" HVY HEX	6000-C11 ③	↓	
	6	2			GSKT	1/16" COMP ASBESTOS	15-01-284 E	ST-PS	
	7	48			BOLTS	3/4" HVY HEX HEAD L=3"	6000-C7 ㉒	MD-PS	
	8	48	5021	5"	NUTS	3/4" HVY HEX	6000-C11 ③	↓	
	9	6			GSKT	1/16" COMP ASBESTOS	15-01-280 E	ST-PS	
	10	32			BOLTS	5/8" HVY HEX HEAD L=3"	6000-C7 ㉕	MD-PS	
	11	32	4021	4"	NUTS	5/8" HVY HEX	6000-C11 ②	↓	
	12	4			GSKT	1/16" COMP ASBESTOS	15-01-278 E	ST-PS	
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –

SERVICE – 220 PSI CONTAM STM SYS - ER
GROUP NO.
6450-0115-1002 SI
SHT 4 OF
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 10 REV. A

INSTALLATION GROUP

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	TR-4	6" TIE ROD ASSY L=6'-9" (2) C=60°	MO 257726 S.4 L.1	SF-PS	
		2	1	TR-11	4" TIE ROD ASSY B=3⅜"	MO 257726 S.2 L.1	↓	
		3	1	TR-13	8" TIE ROD ASSY L=20" (2) C=120°	MO 257726 S.2 L.16	↓	
		4	1	H-11	2" SWING TYPE HGR W/¼" LINER	S 25-46-376	↓	
		5	1	H-11	2" SWING TYPE HGR W/EX LEG W/¼" LINER	MO 257320 S.9 L.6	B10-PS	
		6	1	H-11	5" SWING TYPE HGR W/EX LEG W/¼" LINER	S 25-46-426	SF-PS	
		7	2	H-57	1½" SWING TYPE HGR W/¼" LINER	MO 257726 S.3 L.1	B10-PS	
		8	3	H-11	4" SWING TYPE HGR W/EX LEG W/¼" LINER	S 25-46-416	SF-PS	
		9	1	TR-6	5" TIE ROD ASSY L=37"(2) C=75°	MO 257726 S.3 L.8	↓	
C		10	15'	F-100	3x3x⅜ ∠ STL	MO 257726 S.3 L.14	↓	
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – 220 PSI CONTAM STM SYS - ER
GROUP NO.
6450-0115-1002 SI
SHT 5 OF
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 11 REV. C

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3M	5"IPS X STD THK PIPE STEEL	PIPE DETAIL 6450-705	PS	
		2	1	P3N	↓	↓	↓	
		3	1	P3P	↓	↓	↓	
		4	1	P6AV	2½"IPS	↓	↓	
		5	1	P6AW	↓	↓	↓	
		6	22'-0"	P9	1"IPS	↓	↓	
		7						
		8						
		9	2	50WS1	5" BACKING RING STL (STD)	97-18-133	ST-PS	
		10	2	24WS1	2½" ↓	25-20-914	↓	
		11	2	10CS1	1" COUPLING S.W. 3000# STL	PO ⑱ 6200-M12	MD-PS	
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – 220 PSI CONTAM STM SYS - ER
GROUP NO.
6450-0113-1001 PI
SHT 1 OF
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 12 REV. A

INSTALLATION GROUP

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	2	H-11	5" SWING TYPE HGR W/EX LEG W/¼ LINER	S 25-46-426	ST-PS	
		2	1	H-13	5" SWING TYPE HGR W/¼ LINER	S 25-48-426	↓	
		3	2	H-14	2½" SWING TYPE HGR W/¼ LINER	S 25-49-386	↓	
		4	1	H-14	5" SWING TYPE HGR W/¼" LINER	S 25-49-426	↓	
		5	1	H-13	2½ SWING TYPE HGR W/¼" LINER	S 25-48-386	↓	
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – 220 PSI CONTAM STM SYS - ER
GROUP NO.
6450-0113-1001 PI
SHT 2 OF
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 13 REV. B

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3Q	5"IPS X STD THK PIPE STL	PIPE DETAIL 6450-705	PS	
		2	1	P3R	↓	↓	↓	
		3	1	P7AX	2"IPS	↓	↓	
		4	1	P7AY	↓	↓	↓	
		5	1	P7AZ	↓	↓	↓	
		6	1	P7BA	↓	↓	↓	
	ASSY Nº 2	7	1	P7BB	↓	↓	↓	
		8	1	P7BC	↓	↓	↓	
		9	1	P8BK	1½"IPS	↓	↓	
		10	24"	P10	½"IPS X"X" HVY THK	ON PIPE DET 6450-705	↓	
		11	35'-0"	P9	1"IPS X STD THK	K57-06-104	PS	
		12	30'-0"	P10	½"IPS X"X" HVY THK	K57-07-102	↓	
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – 220 PSI CONTAM STM SYS-ENG RM
GROUP NO.
6450-0114-1001 PI
SHT 1 OF 2
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 14 REV. A

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V503	2" GLOBE STOP 600# SW STL	ON PIPE DET 6450-705	PS	
		2	1	V504	1½" ↓	↓	↓	
		3	1	V505	2" GATE 600# SW STL	↓	↓	
		4	1	V506	1" PRESS RED 150# FLG STL (220/125 PSIG)	↓	↓	
		5	1	V507	[illegible] ANGLE RELIEF 150# FLG STL (SET 150 PSIG)	↓	↓	
		6	1	V5010	½" GLOBE STOP 600# S.W. STL	↓	↓	
		7						
		8						
		9	2	50WS1	5" BACKING RING STL (STD)	97-18-133	SF-PS	
		10	2	10CS1	1" COUPLING S.W. 3000# STL	PO ⑱ 6200-M12	MD-PS	
		11	2	10TS1	1" TEE	↓ ⑫	↓	
		12	2	4CS1	½" COUPLING	↓ ⑯	↓	
		13	3	18RS3	1"x½" INSERT RED S.W. 3000# STL	↓ ㊳	↓	
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – 220 PSI CONTAM STM SYS-ENG RM
GROUP NO.
6450-0114-1001 PI
SHT 2 OF 2
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 15 REV. A

INSTALLATION GROUP

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	3	H-14	5" SWING TYPE HGR W/¼" LINER	S 25-49-426	ST-PS	
		2	5	H-11	1" SWING TYPE HGR W/¼" LINER	S 25-46-346	↓	
		3	2	H-57	1" SWING TYPE HGR W/¼" LINER	MO 257726 S.5 L.1	B10-PS	
		4	1	H-11	1" SWING TYPE HGR W/EX LEG W/¼" LINER	S 25-46-346	ST-PS	
		5	2	H-14	2" SWING TYPE HGR W/¼" LINER	S 25-49-376	↓	
		6	2	H-14	5" SWING TYPE HGR W/EX LEG W/¼" LINER	S 25-49-426	↓	
		7	1	H-11	2" SWING TYPE HGR W/EX LEG W/¼" LINER	S 25-46-376	↓	
		8	2	H-11	2" SWING TYPE HGR W/TWO EX LEGS W/¼ LINER	↓	↓	
		9	5	H-11	2" SWING TYPE HGR W/¼" LINER	↓	↓	
		10	1	H-11	1½" SWING TYPE HGR W/¼" LINER	S 25-46-366	↓	
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

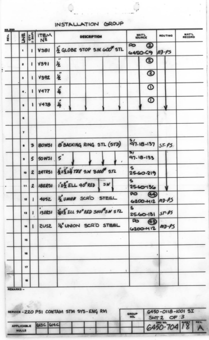
SERVICE – 220 PSI CONTAM STM SYS - ER
GROUP NO.
6450-0114-1001-PI
SHT
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 16 REV. B

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1E	8"IPS X STD THK PIPE STEEL	PIPE DETAIL 6450-705		
		2	1	P1F	↓	↓	PS	
		3	1	P1G	↓	↓	↓	
		4	1	P3S	5"IPS	↓	↓	
		5	1	P3T	↓	↓	↓	
		~~6~~	~~1~~	~~P3U~~				
		7	1	P3BL	↓	↓	↓	
		8	12"	P9	1"IPS	K57-06-104	PS	
		9	18'-0"	P10	½"IPS X"X" HVY THK	K57-07-102	↓	
		10	42"	P11	¼"IPS	K57-07-100	↓	
		11	6"	P12	¾"IPS X STD THK PIPE STEEL	K57-06-103	↓	
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – 220 PSI CONTAM STM SYS-ENG RM
GROUP NO.
6450-0118-1001 SI
SHT 1 OF 3.
APPLICABLE HULLS 613C 614C
DWG NO. 6450-704 SHEET 17 REV. B



INSTALLATION GROUP

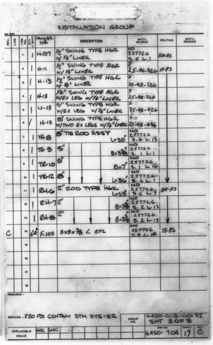
REV.		LINE	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V381	½" GLOBE STOP S.W. 600# STL	PO ② 6450-C9	MD-PS	
		2	1	V391	½" ↓	↓ ②	↓	
		3	1	V392	½" ↓	↓ ②	↓	
		4	1	V477	¼" ↓	↓ ①	↓	
		5	1	V478	¼" ↓	↓ ①	↓	
		6						
		7						
		8	3	80WS1	8" BACKING RING STL (STD)	S/ 97-18-137	ST-PS	
		9	5	50WS1	5" ↓	S/ 97-18-133	↓	
		10	2	24TRS1	½"x½"x¼" TEE S.W 3000# STL	S 25-60-219	↓	
		11	2	18ERS1	1"x½" ELL 90° RED ↓ SW ↓	S 25-60-136	↓	
		12	1	4US2	½" UNION SCR'D STEEL	PO (44) 6200-M12	MD-PS	
		13	1	13ERS1	¾"x½" ELL 90° RED 3000# SW STL	S 25-60-131	ST-PS	
		14	1	2US2	¼" UNION SCR'D STEEL	PO (43) 6200-M12	MD-PS	
		15						
		16						
		17						
		18						

REMARKS –

SERVICE - 220 PSI CONTAM STM SYS - ENG RM

GROUP NO.	6450-0118-1001 SI SHT 2 OF 3

APPLICABLE HULLS	613C	614C								DWG NO. 6450-704	SHEET 18	REV. A



INSTALLATION GROUP

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	H-57	½" SWING TYPE HGR w/ ¼" LINER	MO 257726 S. 5 L. 1	BII-PS	
		2	1	H-11	½" SWING TYPE HGR w/ ¼" LINER	S/O 25-46-326	ST-PS	
		3	1	H-13	½" SWING TYPE HGR w/ ¼" LINER	S/O 25-48-326	↓	
		4	1	H-13	½" SWING TYPE HGR W/EX LEG w/ ¼" LINER	S/O 25-48-326	↓	
		5	1	H-13	5" SWING TYPE HGR W/EX LEG w/ ¼" LINER	S/O 25-48-426	↓	
		6	1	H-13	8" SWING TYPE HGR W/TWO EX LEGS w/ ¼" LINER	S/O 25-48-446	↓	
		7	1	TR-8	8" TIE ROD ASSY L=30"	MO 257726 S. 4 L. 13	↓	
		8	1	TR-9	5" ↓ B=3⅜"	MO 257726 S. 1 L. 1	↓	
		9	1	TR-10	5" ↓ B=7"	MO 257726 S. 1 L. 16	↓	
		10	1	TR-12	8" ↓ L=36"	MO 257726 S. 6 L. 1	↓	
		11	1	RH-6	2" ROD TYPE HGR L=59"	MO 257726 S. 6 L. 7	BII-PS	
		12	1	RH-7	2" ↓ B=3⅜"	MO 257726 S. 2 L. 13	↓	
		13	1	RH-8	2" ↓ B=3⅜"	MO 257726 S. 2 L. 13	↓	
C		14	6'0"	F-100	3x3x⅜ ∠ STL	MO 257726 S. 3 L. 14	ST-PS	
		15						
		16						
		17						
		18						

REMARKS –

SERVICE - 220 PSI CONTAM STM SYS - ER

GROUP NO.	6450-0118-1001 SI SHT 3 OF 3

APPLICABLE HULLS	613C	614C								DWG NO. 6450-704	SHEET 19	REV. C

6450-704

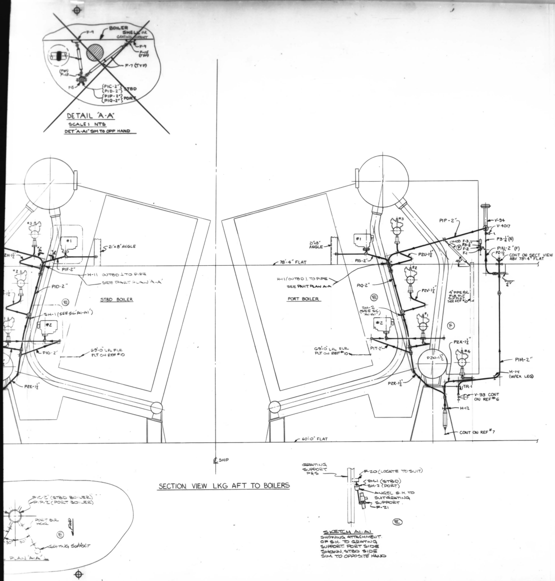
MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME

8X


BOILER SHELL OR GRATING SUPPORT
F-9
F-9
F-15 (TYP)
F-7 (TYP)
(TYP) F-15
F-8
P1C-2"
P1D-2" STBD
P1P-2"
P1Q-2" PORT
DETAIL "A-A"
SCALE: NTS
DET "A-A1" SIM TO OPP HAND
21"x8" ANGLE
P1F-2"
H-11 OUTBD ⊥ TO PIPE
SEE PART PLAN 'A-A'
P1D-2"
STBD BOILER
SH-1 (SEE SK 'A1-A1')
#1
#2
#3
P1G-2"
63'-0" L/L FLR PLT ON REF #10
P2E-1½"
78'-4" FLAT
21"x8" ANGLE
P1S-2"
H-11 OUTBD ⊥ TO PIPE
SEE PART PLAN A-A
P1Q-2"
PORT BOILER
SH-2 (SEE SK 'A1-A1')
P2U-1½"
P2V-1½"
P1F-2"
P1T-2"
63'-0" L/L FLR PLT ON REF #10
P2R-1½"
P2W-1½"
P2X-1½"
#4
4" PIPE FDL FLR PLT SUPPORT SEE REF #10
P1F-2"
H-100 F-3 F-2 F-1
V-94
V-4017
P3-¼"(N)
P1N-2"(F)
P2-1½"
CONT ON SECT VIEW ABV 78'-4" FLAT
P1M-2"
H-14 (W/EX LEG)
TR-1
V-93 CONT ON REF #6
H-12
CONT ON REF #7
60'-0" FLAT
℄ SHIP
SECTION VIEW LKG AFT TO BOILERS
GRATING SUPPORT P&S
F-20 (LOCATE TO SUIT)
SH-1 (STBD)
SH-2 (PORT)
ANGEL S.H. TO SUIT GRATING SUPPORT
F-21
SKETCH A1-A1
SHOWING ATTACHMENT OF S.H. TO GRATING SUPPORT. PORT SIDE SHOWN, STBD SIDE SIM. TO OPPOSITE HAND
P1C-2" (STBD BOILER)
P1P-2" (PORT BOILER)
PORT BLR HGR
FWD
30°
GRATING SUPPORT
PLAN 'A-A'
E
F

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
A	–	INITIAL ISSUE	3/3/7	JKJ	–	–
B	–	ADDED SPECIAL HGRS RERAN P1S, P1T, P1F, P1G, P2K, & P2W	8/17/7	JKJ	–	–
C	–	ALT'D P1A, P1B, P1C, P1M, P1N & P1P-2". ADDED 1½" PIPING RUNS TO REGENERATIVE AIR HEATERS. ERS ALT'D DET "A-A", "B-B" & "C-C" & ADDED F-15	10/21/7	JKJ	–	–
D	–	ALT'D PIPES P1S-2", P1T-2", P1F-2 & P1G-2"			–	–
		IN NOTE 8, FLANGE WELDS CORRECTED FROM P.14A TO P.14.	1/20/8	JKJ		
E	–	ALTERED FLANGE SIZE ON OUTLET SIDE OF AIR HEATER CONTROL VALVE. ADDED DRAIN BELOW INLET TO AIR HEATER CLEANING DEVICE. WORK ACCOMPLISHED ON 613C. ERS			–	–
	–	ALT'D HANGERS ON BOILER FRONT. DELETED DETAILS "A-A" & "B-B", SECT "C-C". ADDED PARTIAL PLAN "A-A" & SKETCH A1-A1. THIS TO SUIT "E.T." COMMENTS	11/12/8	JKJ		
F	–	ALT'D STM LOOP TO RETRACT SOOT BLOWER NO. 2 ON PORT & STBD BOILER				
	1A	ADDED REF NO. 10.				
	–	SECTION VIEW LKG AFT TO BOILERS; ADDED H-100 TO P1C-2" (STBD) & P1P-2" (PORT). WORK ACCOMP ON 613C BY LIAISON NO. 613C-JHJ-110)	3/13/9	JKJ		

~~AUTHORITY:~~

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REF.# 1 & 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE U.S.C.G. AND A.B.S. SEE REF# 1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. & REF#3.
4. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMP AND ETC.
5. PAINTING IS TO BE IN ACCORDANCE WITH REF#5.
6. TEST ARE TO BE IN ACCORDANCE WITH REF# 1.
7. INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REF# 4.
8. ALL WELDS ACCOMPLISHED ABOARD SHALL BE AS FOLLOW: BUTT WELDS P-3, SOCKET WELDS TYPE P-14, AND FLANGE WELDS TYPE P-14 ON REF#3 EXCEPT AS OTHERWISE INDICATED.
9. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
10. ALL PIPING ON THIS DRAWING IS CLASS I.
11. HANGERS (SH-1, FOR EXAMPLE) AND TIE RODS (TR-1, FOR EXAMPLE) INDICATED ON PLAN ARE TO BE INSTALLED WITHIN 6" OF POSITION SHOWN ON REF# 9.

FOR LIST OF MAT'L SEE DWG № 6450-707

DWG. REV.—HULL APPLIC.			
REV	NN HULLS ONLY		
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	NO
E	YES	YES	NO
F	Yes	Yes	No

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 1-12-9 SIGNED J K Johnson

YARD PRINTS
ORDERED BY DESIGN
GROUP: MC NO.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS	
OWNERS	ABS NOT REQ'D
	USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

SCALE ½" = 1 FT
DRAWN E.R. SMOOT
CHECKED TE SEAMAN
SECT MGR J K Johnson
DATE COMPL. 3.3.7
EXAMINED
AUTHORIZED J F Stephenson
DATE 3-3-7
TECH APPROVAL
CSD APPROVAL

PIPING ARR BOILER SOOT BLOWER STEAM - ELEV & SECT

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO.
DWG NO. 6450-706 REV F SHEET NO. 1 OF 1

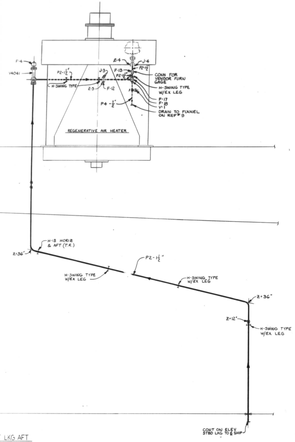
NO.	REFERENCES	DWG NO.
10	ARR FLR PLTS & GRAT 60'-0" TO 78'-4" L/L-ER	6650-236
9	PP ARR AUX CONDENSATE SYS - PLAN, SECT, ELEV	6552-410
8	PP ARR SHIP SERV AIR E.R. ABV 60'-0" FLAT	6454-556
7	PP ARR L.P. ST DRAIN SYS E.R. - PLAN, SECT, ELEV	6555-[illegible]
6	PP ARR BOILER PRESS AUX STEAM - PLAN, SECT, ELEV	6450-737
5	PAINTING SCHEDULE	8300-30 31
4	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
3	FABRICATION & WELDING INSTRUCTIONS - CL I & II PP	257035
2	DIAG AUX STEAM SYS - L/M	6450-684
1	DIAG AUX STEAM SYS - ARR	6450-683

● HULLS 613C & 614C
▲ HULL 615C

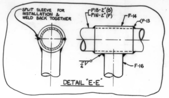
6450-706

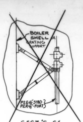
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 1
10X

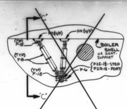

F-4
V4041
P2-1½"
H-SWING TYPE
J-3
Z-3
F-12
Z-4
J-4
F-13
P2-1½"
CONN FOR VENDOR FURN GAGE
H-SWING TYPE W/EX LEG
F-17
F-18
V-1
P4-½"
DRAIN TO FUNNEL ON REF# 9
REGENERATIVE AIR HEATER
H-13 HORIZ & AFT (T.R.)
Z-36"
P2-1½"
H-SWING TYPE W/EX LEG
H-SWING TYPE W/EX LEG
Z-36"
Z-12"
H-SWING TYPE W/EX LEG
CONT ON ELEV STBD LKG TO ℄ SHIP

LAT LKG AFT
OF BHD 23


SPLIT SLEEVE FOR INSTALLATION & WELD BACK TOGETHER
P1B-2"(S)
P1N-2"(P)
F-14
P-13
¼"
F-16
DETAIL "E-E"

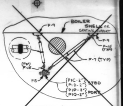

BOILER SHELL OR GRATING SUPPORT
P2E-1½"-STBD
P2R-1½"-PORT

SECT "C-C"
SCALE : NTS

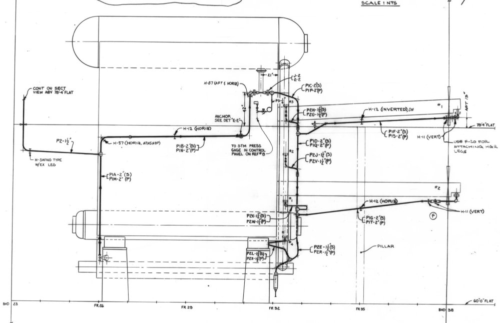

"C"
F-9 (N/F)
F-9 (N/F)
(TYP) F-15
(TYP) F-8
BOILER SHELL OR GRAT. SUPPORT
P2E-1½-STBD
P2R-1½-PORT
F-6
(TYP) F-15
"C"

DETAIL "B-B"
SCALE : NTS
DET "B-B1" SIM TO OPP HAND

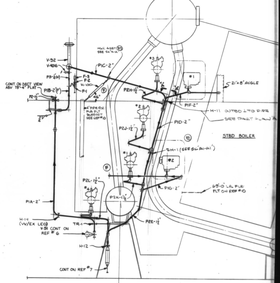
✳ NOTE:
NO HANGERS ARE
TO BE ATTACHED
TO BOILER ALUM.
SHEATHING.

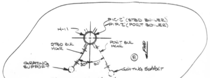

F-9
BOILER SHELL OR GRATING SUPPORT
F-9
F-15 (TYP)
F-7 (TYP)
(TYP) F-15
F-5
P1C-2"
P1D-2" STBD
P1P-2"
P1Q-2" PORT

DETAIL "A-A"
SCALE : NTS
DET "A-A1" SIM TO OPP HAND


CONT ON SECT VIEW ABV 78'-4" FLAT
P2-1½"
H-SWING TYPE W/EX LEG
H-57 (HORIZ, ATHSHIP)
H-12 (HORIZ)
P1B-2"(S)
P1N-2"(P)
P1A-2"(S)
P1M-2"(P)
H-57 (AFT & HORIZ)
21"
J-2
Z-2
42"
ANCHOR SEE DET "E-E"
TO STM PRESS GAGE IN CONTROL PANEL ON REF#8
P3-¼"
#3
P1C-2"(S)
P1P-2"(P)
P2H-1½"(S)
P2U-1½"(P)
H-12 (INVERTED), DN
#1
ABT 15"
78'-4" FLAT
P1F-2"(S)
P1S-2"(P)
H-11 (VERT)
USE F-20 FOR ATTACHING HGR LEGS
P1D-2"(S)
P1Q-2"(P)
#2
P2J-1½"(S)
P2V-1½"(P)
#2
H-12 (HORIZ)
H-11 (VERT)
F
#1
P2K-1½"(S)
P2W-1½"(P)
P1G-2"(S)
P1T-2"(P)
#4
P2L-1½"(S)
P2X-1½"(P)
P2E-1½"(S)
P2R-1½"(P)
PILLAR
BHD 23
FR 26
FR 29
FR 32
FR 35
BHD 38
60'-0" FLAT

ELEVATION VIEW STBD LKG TO ℄ SHIP
PORT SIDE SIMILAR TO OPPOSITE HAND

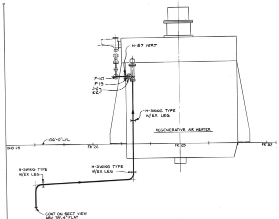

HGR ASSY 99 SEE SK "A-A"
V-92
V-4016
P3-¼(N)
F-3
F-2
H-100
F-1
P1C-2"
CONT ON SECT VIEW ABV 78'-4" FLAT
P1B-2"(F)
P2-1½"
¼"
F
46°
4" PIPE FOR FLR PLT SUPPORT SEE REF#10
#3
#1
P2H-1½"
21"×8" ANGLE
P1F-2"
H-11 OUTBD ⊥ TO PIPE
SEE PART PLAN "A"
#2
P2J-1½"
P1D-2"
E
STBD BOILER
SH-1 (SEE SK "A1-A1")
#1
#2
F
P2L-1½"
#4
P1G-2"
69'-0" LVL FLR PLT ON REF#10
P1A-2"
P2K-1½"
P2E-1½"
H-14 (W/EX LEG)
TR-1
V-91 CONT ON REF # 6
H-12
CONT ON REF #7


H-11
P1C-2" (STBD BOILER)
P1P-2" (PORT BOILER)
STBD BLR HGR
PORT BLR HGR
FWD
E
GRATING SUPPORT
30°
30°
GRATING SUPPORT

PARTIAL PLAN "A-A" ⊥
TO PIPE

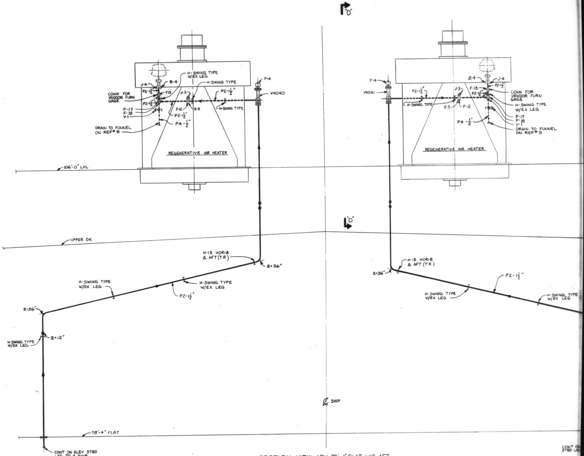
6450-706

SEPT. '80
FRAME 2
10X


H-57 VERT
F-10
F-19
J-2
Z-2
H-SWING TYPE
W/EX LEG
REGENERATIVE AIR HEATER
106'-0" LVL
BHD 23
FR 26
FR 29
FR 32
H-SWING TYPE
W/EX LEG
H-SWING TYPE
W/EX LEG
CONT ON SECT VIEW
ABV 78'-4" FLAT

SECTION VIEW "D-D" ℄ LKG PORT

STBD SIDE SIMILAR TO OPPOSITE HAND


"D"
"D"
H-SWING TYPE
W/EX LEG
H-SWING TYPE
J-4
Z-4
P2-1½"
F13
CONN FOR
VENDOR FURN
GAGE
P2-1½"
F-17
F-18
V-1
DRAIN TO FUNNEL
ON REF# 9
J-3
F-12
Z-3
P2-1½"
P4-½"
P2-1½"
H-SWING TYPE
F-4
V4040
REGENERATIVE AIR HEATER
106'-0" LVL
UPPER DK
H-13 HORIZ
& AFT (T.R.)
Z=36"
H-SWING TYPE
W/EX LEG
H-SWING TYPE
W/EX LEG
P2-1½"
Z=36"
H-SWING TYPE
W/EX LEG
Z=12"
℄ SHIP
78'-4" FLAT
CONT ON ELEV STBD
LKG TO ℄ SHIP
F-4
V4041
P2-1½"
H-SWING TYPE
Z-3
J-3
F-12
F-13
P2-1½"
Z-4
J-4
P2-1½"
CONN FOR
VENDOR FURN
GAGE
H-SWING TYPE
W/EX LEG
F-17
F-18
V-1
DRAIN TO FUNNEL
ON REF# 9
P4-½"
REGENERATIVE AIR HEATER
H-13 HORIZ
& AFT (T.R.)
Z=36"
P2-1½"
H-SWING TYPE
W/EX LEG
H-SWING TYPE
W/EX LEG
CONT ON
STBD LK

SECTION VIEW ABV 78'-4" FLAT LKG AFT

"Z" DIMENSION IS DISTANCE FWD OF BHD 23

6450-706

MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 3

10X

6450-707 CSD VAULT

E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 11-12-9

YARD PRINTS — ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS								
REV.	F	F	A	E	E	C	F
SHEET	1	2	3	4	5	4A	4B

GROUP
MC NO.

NNS&DD Co. HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C	311		
614C	310		
613C	309	T11-S-116a	

DWG. REV. — HULL APPLIC. (NN HULLS ONLY)

REV.	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	NO
E	YES	YES	NO
F	YES	YES	NO

APPROVALS
OWNERS
ABS NOT REQ'D
USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING

INSTALLATION GROUPS 6450-0114-1007 SI

ARR DWG 6450-706
PIPE DETAIL 6450-708

SCALE NONE =1 Ft.
DRAWN E.R. SMOOT
CHECKED TE SEAMAN
SECT. MGR. J H Johnson
DATE COMPL. 3-3-7
EXAMINED
AUTHORIZED E E Stephenson
DATE 3-3-7
TECH. APPROVAL NOT REQ'D
CSD APPROVAL R. L. Harrington

HULL 613C

TITLE
PIPING ARR BOILER SOOT BLOWER STEAM-LIST OF MATERIAL

TYPE OF DWG.

DWG. NO. 6450-707 REV F SHEET NO. 1 OF 5

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	AUTH'D.	OWNER DATE	APPD.
A	ALL	INITIAL ISSUE	3/3/7	JHJ	—	—
B	4A	ADDED	8/17/7	JHJ	—	—
C	4 4A 4B 5	ADDED LN 6 & 18; ALT'D SIZE, TYPE OF VALVE & SOURCE OF MAT'L FOR LN 7 & 8. ADDED LN 15, 16 & 17 ADDED SHT 4B. ADDED SHT 4-12.	10/21/7	AC JHJ	—	—
D	4	ALTERED ITEM NO. FOR SOURCE OF MAT'L LINE 14. ERS	10/24/8	AC JHJ	—	—
E	4 4B 5	DELETED LINE 17. INCREASED QTY LINE 18, WAS 2. ADDED LINES 4, 12, 13, 14, & 16-17 DELETED LINES 1, 2 & 3. INCREASED QTY LINES 4, 5, & 6, QTY WAS 16, 32, & 2. WORK ACCOMPLISHED ON 613C. ERS			—	—
	4A	QTY OF L. 1 WAS 8. ADDED L'S 8, 9 & 18 DELETED L'S 11 THRU 15. WK (WORK ACCOMP ON 613C)	1/12/9	AC JHJ		
F	4B	ADDED L.15. (WORK ACCOMP ON 613C BY LIAISON NO. 613C-JHJ-110)				

NOTES

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF#1.

NO.	REFERENCES	DWG. NO.
1	DIAG AUX STEAM SYS -LIST	6450-684

HULL NO. 613C, 614C, 615C DWG. NO. 6450-707 REV. F SHEET 2 OF —

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1A	2" IPS x "X" HVY THK PIPE STL	PIPE DETAIL 6450-708	PS	
		2	1	P1B				
		3	1	P1C				
		4	1	P1D				
		5	1	P2E	1½" IPS			
		6	1	P1F	2" IPS			
		7	1	P1G				
		8	1	P2H	1½" IPS			
		9	1	P2J				
		10	1	P2K				
		11	1	P2L				
		12	1	P1M	2" IPS			
		13	1	P1N				
		14	1	P1P				
		15	1	P1Q				
		16	1	P2R	1½" IPS			
		17	1	P1S	2" IPS			
		18	1	P1T				

REMARKS -

PS 180

SERVICE - BOILER SOOT BLOWER STM
GROUP NO. 6450-0114-1007 SI SHT 1 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-707 SHEET 3 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2U	1½" IPS x "X" HVY THK PIPE STL	PIPE DETAIL 6450-708	PS	
		2	1	P2V				
		3	1	P2W				
		4	1	P2X				
		5	7'-0"	P3	¼" IPS x "X" HVY THK PIPE STL	S/ 57-07-100	ST-PS	
C		6	180'-0"	P2	1½" IPS x "X" HVY THK PIPE STL	S/ 57-07-106		
C		7	1	V-92	2" CONTROL VALVE 600# S.W. STL	PIPE DETAIL 6450-708	MD-PS	
C		8	1	V-94	2"			
		9	1	V-4016	¼" GLOBE STOP 600# S.W. STL	S/ 26-09-260	ST-PS	
		10	1	V-4017	¼"			
		11						
		12	2	F-1	¼" TEE 3000# S.W. STL	S/ 25-60-075	ST-PS	
		13	2	F-2	¼" UNION	P.O. ⑰ 6555-C8	MD-PS	
D		14	2	F-3	EMERGENCY REVERSE PRESSURE SWITCH (407) (EL. SYM. #5042-17)	PO (11-15) 6800-M1		
		15	2	F-4	OIL RESERVOIR FOR CONTROL VALVE (V4040 & V4041)	P.O. (11-15) 6800-M1		
		16						
E		17	~~2~~	~~J-1~~	~~1½" FLANGE 600# S.W. STL~~	~~PO ⑱ (3)614C-6450-C2 (3)613C-6450-C47 ①~~	MD-PS	
E		18	4	J-2	2" FLANGE 600# S.W. STL	PO ④ 6450-C54		

REMARKS -

PS 180

SERVICE - BOILER SOOT BLOWER STM
GROUP NO. 6450-0114-1007 SI SHT 2 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-707 SHEET 4 REV. E

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
E		1	10	H-11	2" SWING HGR	S 25-46-376	ST-PS	
		2	6	H-12	2"	S 25-47-376		
		3	2	H-12	1½"	S 25-47-366		
		4	2	TR-1	2" TIE ROD HGR	MO 283176 S38 L13	B10-PS	
		5	4	H-57	2" SWING HGR	MO 283176 S39 L1		
		6	2	H-14	2" W/EX LEG	S 25-49-376	ST-PS	
E		7	10'-0"	F-20	3x3x5/16 ∠ STL	S/ 73-05-242		
E		8	1	SH-1	2" SPRING HGR — COLD LOAD 172# — HOT LOAD 165# — VERT MOVE COLD TO HOT .18" UP	PO ② 6552-C16		
E		9	1	SH-2	COLD LOAD 172# — HOT LOAD 165# — VERT MOVE COLD TO HOT .18" UP			
		10	4	F-5	2" PIPE CLAMP	S 25-43-376	ST-PS	
E		~~11~~	~~2~~	~~F-6~~	~~1½"~~	~~S 25-43-366~~		
E		~~12~~	~~24~~	~~F-7~~	~~2" FABRICATED LEG STL 12" LG~~	~~S 25-50-606~~		
E		~~13~~	~~28~~	~~F-8~~	~~1½"~~	~~S 25-50-600~~		
E		~~14~~	~~16~~	~~F-9~~	~~6"x6"x⅜" THK PL STL~~	~~S 72-37-150~~	~~X10-PS~~	
E		~~15~~	~~14~~	~~F-15~~	~~1¼ x ¼ STL F.B. ABS GR A 4" LG~~	~~S 71-30-210~~	~~ST-PS~~	
C		16	1	V4040	1½" CONTROL V. 600# FLG STL	P.O. (11-14) 6800-M1	MD-PS	
C		17	1	V4041	1½"			
E		18	2	F-21	2" PIPE CLAMP	S/ 25-43-376		

REMARKS -

SERVICE - BOILER SOOT BLOWER STM
GROUP NO. 6450-0114-1007 SI SHT 2A OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-707 SHEET 4A REV. E

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	4	J-3	1½" R.F. FLANGE 600# SLIP-ON	P.O. (11-17) 6800-M1	MD-PS	
C		2	2	J-4	1½" R.F. FLANGE 300# SLIP-ON	PO (11-18) 6800-M1		
		3						
E		4	2	V-1	½" GLOBE STOP VALVE STEEL S.W. 600#	S/ 26-09-275	ST-PS	
		5						
C		6	4	F-10	1½" 90° ELBOW 3000# S.W. STL	S/ 25-60-010	ST-PS	
C		7	10	F-11	1½" COUPLING 3000# S.W. STL	S/ 25-60-056		
C		8	2	F-12	ORIFICE PLATE	PO (11-19) 6800-M1	MD-PS	
C		9	2	F-13	1½"x1½"x¼" RED. TEE 3000# S.W. STL	S/ 25-60-275	ST-PS	
C		10	2	F-14	PIPE SLEEVE MADE FROM 2½" IPS x STD THK PIPE STL L=4"	S/ 57-06-108		
C		11	2	F-16	1½" IPS x STD THK PIPE STL L=24"	S/ 57-06-106		
E		12	2	F-17	1½" TEE S.W. STEEL 3000#	S/ 25-60-081		
E		13	2	F-18	1½"x½" INSERT REDUCER S.W. STL 3000#	S/ 25-60-380		
E		14	2	F-19	2"x1½" INSERT REDUCER S.W. STL 3000#	S/ 25-60-382		
F		15	2	H-100	2" HANGER (TIE ROD)	MO 257726 S.31 L.1		
E		16	30'-0"	P4	½" IPS x "X" HVY THK PIPE STEEL	S/ 57-07-102	ST-PS	
		17						
		18						

REMARKS -

SERVICE - BOILER SOOT BLOWER STM
GROUP NO. 6450-0114-1007 SI SHT 2B OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-707 SHEET 4B REV. F

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
E	1	~~8~~	~~Z-1~~	~~1½"~~	~~BOLT STUD~~	~~¾" CONTINUOUS THD L=4½"~~	~~S/ 21-18-568~~	ST-PS	
E	2	~~16~~			~~NUTS~~	~~¾" HVY HEX~~	~~S/ 21-30-104~~		
E	3	~~2~~			~~GSKT~~	~~FLEXITALLIC STYLE CG 600#~~	~~S/ 15-04-106~~		
E	4	32	Z-2	2"	BOLT STUD	⅝" CONTINUOUS THD L=4½"	S/ 21-18-548		
E	5	64			NUTS	⅝" HVY HEX	S/ 21-30-102		
E	6	4			GSKT	FLEXITALLIC STYLE CG 600#	S/ 15-04-108		
C	7	8	Z-3	1½"	BOLT STUD	¾" CONTINUOUS THD L=4¾"	PO 6800-M1 (11-20)	MD-PS	
C	8	16			NUTS	¾" HVY HEX	PO 6800-M1 (11-21)		
C	9	4			GSKT	FLEXITALLIC STYLE CG 600#	PO 6800-M1 (11-22)		
C	10	8	Z-4	1½	BOLT STUD	¾" CONTINUOUS THD L=3½"	PO 6800-M1 (11-23)		
C	11	16			NUTS	¾ HVY HEX	PO 6800-M1 (11-24)		
C	12	2			GSKT	CRANITE STYLE 300#	PO 6800-M1 (11-25)		
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

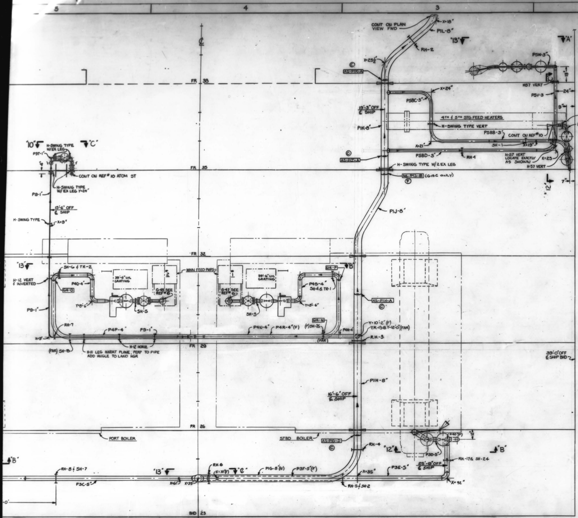
PS — 180

SERVICE - BOILER SOOT BLOWER STM
GROUP NO. 6450-0114-1007 SI SHT 3 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-707 SHEET 5 REV. E

6450-707

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80
FRAME
8X



CONT ON PLAN VIEW FWD
X=18"
PIL-8"
RH-2
"13"
"A"
X=25½"
AS-PIK-A
FR 38
X=24"
P5W-3"
P5BC-3"
H57 VERT
24"
P5V-3
13'-3" OFF ℄ SHIP
4TH & 5TH STG FEED HEATERS
H-SWING TYPE VERT
PIK-8"
H-SWING TYPE W/EX LEG
P5X-3"
P5BB-3"
CONT ON REF# 10
X=21"
SH-1
X=19"
P5BD-3"
RH-1
H-57 VERT LOCATE EXACTLY AS SHOWN
X=23
H-57 VERT
"10"
"C"
H-SWING TYPE W/EX LEG
P8T-1"
CONT ON REF# 10 ATOM ST
H-SWING TYPE W/EX LEG Y=24"
FR 35
H-SWING TYPE W/2 EX LEG
AS-PIJ-B (G13C ONLY)
"12"
P8-1"
13'-6" OFF ℄ SHIP
H-SWING TYPE
X=9"
PIJ-8"
FR 32
"13"
SH-6 & TR-2
MAIN FEED PMPS
G14-P
"B"
H-12 VERT & INVERTED
P4Q-4"
39'-6" LVL GRATING
2
1
39'-6" LVL GRATING
P4S-4"
SH-4 & TR-1
G-48 SEE REF# 5
G-47 SEE REF# 5
AS-PIH-A
P8-1"
SH-5
SH-3
RH-7
P4P-4"
P9-1"
P4U-4"
P4R-4"(F)
SH-25
Y=10'-2"(F)
TR-15 & Y=12'-0"(FAR)
R.H.-3
X=5"
(FAR) SH-8
H-11 LEG INVERT PLANE, PERP TO PIPE ADD ANGLE TO LAND HGR
H-12 HORIZ
FR 29
39'-0" OFF ℄ SHIP BHD
PIH-8"
16'-6" OFF ℄ SHIP
FR 26
PORT BOILER
STBD BOILER
AS-PIG-D
RH-4
"12"
P3D-5"
"B"
RH-17 & SH-24
"B"
RH-8 & SH-7
"13"
RH-6
X=70"(F)
"C"
PIG-8"(N)
P3F-5"(F)
P3E-5"
25'-9" OFF ℄ SHIP
P3C-5"
X=61
X=35"
RH-5 & SH-2
X=42"
X=35"
BHD 23

PLAN VIEW BELOW 78'-4" FLAT AFT

"X" DIMENSIONS ARE TAKEN FROM 60'-0" FLAT &
"Y" DIMENSIONS ARE TAKEN FROM 33'-0" FLAT
UNLESS OTHERWISE NOTED.

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH	OWNER DATE	OWNER APPD
A	ALL	INITIAL ISSUE	4/2/76		—	—
B	—	DRAWING GENERALLY REVISED TO SUIT DESIGN DEVELOPMENT	6/4/7		—	—
C		ADDED WELD IDENT. NOS., REF. 20 & NOTE 17. JCB	8/17/7		—	—
D	10C 12A 13B	ALT'D SIZE OF PIPE 25'-6" OFF ℄ SHIP (P) WAS 2½". SECT 12-A & ELEV 13-B ALT'D TO SUIT.	2/24/7		—	—
E	—	ADDED SKETCH NO. WHERE REF #18 IS NOTED.				
	1A	ADDED REF# 21 & #22				
	11A	DELETED ½" SENSING LINE FOR V-101	5/15/7		—	—
F	3C	PLAN VIEW BEL 78'-4" FLAT; ADDED WELD IDENT NO. AS-PIJ-B FOR G13C ONLY.				
	10A	ADDED FTG NO. (F-301) TO DESUPHTR TEMP CONTROL				
	12A	ADDED FTG NO. (F-302) TO DESUPHTR TEMP CONTROL	8/29/7		—	—
G	—	ADDED ADDITIONAL WELD INDEX NUMBERS FOR G14C ONLY. ADDED NOTE# 18 + REF# 23	1/5/79		—	—
H	12A	SECT VIEW "12-A"; ALT'D SENSING LINE TO V146. (WORK ACCOMP ON G13C BY LIAISON NO. G13C-IHJ-67)	4/21/79			
J		DELETED WELD G14T FOR H614C ONLY (TO SUIT SHIP REQUEST)	8/2/79			

~~AUTHORITY:~~

GENERAL NOTES:

1. THIS PLAN DEVELOPED IN ACCORDANCE WITH REF. # 1 & 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD & THE AMERICAN BUREAU OF SHIPPING. SEE REF. #2 FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S. COAST GUARD, THE A.B.S., & REF. # 3.
4. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS BUTT WELDS TYPE P-3 & SOCKET WELDS TYPE P14A ON REF# 3 EXCEPT AS OTHERWISE INDICATED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS & HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS PUMPS, ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN. ALL BENDING RADII SHALL BE 5 TIMES THE NOMINAL DIAMETER.
7. PAINTING IS TO BE IN ACCORDANCE WITH REF.# 8.
8. TESTS ARE TO BE IN ACCORDANCE WITH REF.# 2.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REF.# 5.
10. PIPE HANGERS ARE TO BE AS DETAILED ON REF# 19 UNLESS OTHERWISE NOTED.
11. ALL PIPING ON THIS ARRANGEMENT IS CLASS I EXCEPT THAT PORTION DOWN STREAM OF V-121, V-106, V-107, V-138, & V-139 IS CLASS II.
12. BACKING RINGS & COUPLINGS SHOWN IN MATERIAL LIST ARE TO BE USED AS REQUIRED.
13. SPRING HANGERS (SH-1, FOR EXAMPLE) AND TIE RODS (TR-1, FOR EXAMPLE) INDICATED ON PLAN ARE TO BE INSTALLED WITHIN 6" OF POSITION.
14. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
15. ALL HOLE CUTS ARE PROVIDED ON STRUCTURAL DWGS.
16. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
17. SYMBOLS AS-P3A-A, ETC. INDICATE WELDS Ⓒ REQUIRING NDT AND/OR STRESS RELIEF TO SUIT REF. 3 & AS LISTED ON REF. 20.
18. WELD JOINTS MARKED THUS G14- ARE TO BE Ⓖ RADIOGRAPHED FOR H614C ONLY IN ACCORDANCE WITH REF# 23.

FOR LIST OF MATERIAL, SEE 6450-738.

NO.	REFERENCES	DWG NO.
Ⓖ 23	WELD INDEX TABULATION FOR MISC PIPING SYS (G14C ONLY)	283301
22	PP ARR CONT AIR IN ER BEL 60'-0" LVL	6454-540
21	PP ARR CONT AIR IN ER ABV 60'-0" LVL	6454-659
Ⓒ 20	WELD INDEX TAB.- BOILER PRESS. AUX. STEAM	6450-833
19	PIPE HANGERS - BOILER PRESSURE AUXILIARY STM-ER - FOR ARR 6450-737	6450-762
18	PIPING ARR MISC INSTRUMENTS IN ER	6755-67
17	LIST OF PRESS & VAC GAGES & THERM FURN BY SUBCONTR	6750-484
16	ARR STEAM & EXH IN CARGO PUMP RM	6450-679
15	PIPING ARR- HP ST DRAIN SYS- ER	6555-475
14	PIPING ARR- LP ST DRAIN SYS- ER	6555-466
13	PIPING ARR 220 PSI CONTAMINATED ST SYS-ER	6450-703
12	PIPING ARR- BOILER SOOT BLOWER ST-ER	6450-706
11	PIPING ARR- AUX EXHAUST ST SYS - ER	6451-473
10	PIPING ARR - REDUCED PRESS ST - ER	6450-740
9	PIPING ARR- RELIEF VALVE ESCAPE SYS-ER	6451-494
8	PAINTING SCHEDULE	8300-40
7	LIST OF THERMOMETERS FURN BY SHIPYARD	6750-482
6	LIST OF PRESS & VAC GAGES FURN BY SHIPYARD	6750-483
5	TYPICAL ARR OF GAGE PIPING	6750-481
4	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
3	FABRICATION & WELDING INSTRUCTIONS-CL I & II PP	257035
2	DIAGRAM- AUX STEAM SYS - L/M	6450-684
1	DIAGRAM- AUX STEAM SYS - ARR	6450-683

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C 613C	310 309	

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689

SCALE 1/2" = 1 FT
DRAWN E.R. SMOOT
CHECKED T.E. SEAMAN
SECT MGR J.R. Johnson
DATE COMPL. 4-28-76
EXAMINED —
AUTHORIZED E.E. Stephenson
DATE
TECH APPROVAL 4-7-76
CSD APPROVAL R.L. Warrington

PIPING ARR BOILER PRESSURE AUX STEAM - PLAN, SECT, & ELEV

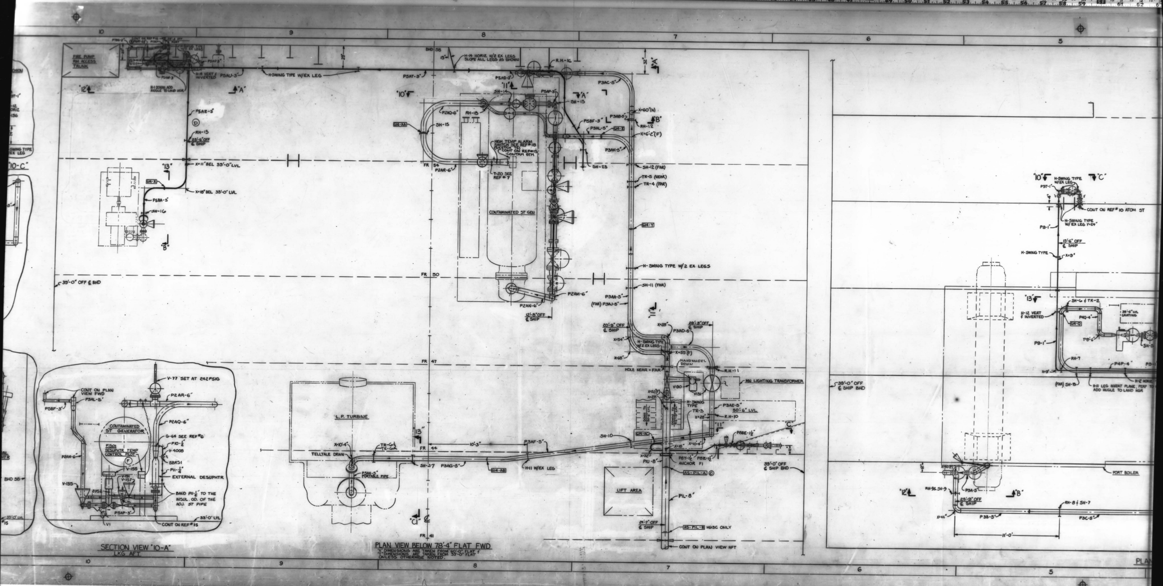
USMA DESIGN T11-S-1162
USMA DWG NO. —
HULL NO. —
DWG NO. 6450-737
REV J
SHEET NO. 1 OF 1

GROUP:

6450.737

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 1
10X


FIRE PUMP RM ACCESS TRUNK
BHD 58
H-14 HORIZ W/2 EX LEGS SLOPE ALL LEGS AS SHOWN
H-SWING TYPE W/EX LEG
P5AU-3"
P5AT-3"
P5AS-3"
R.H-16
P3AC-5"
"A"
"B"
"12"
"10"
"11"
"13"
P5AE-3"
RH-13
25'-6" OFF ℄ SHIP
X=11" BEL 33'-0" LVL
X=18" BEL 33'-0" LVL
P5BA-5"
SH-16
SH-14
SH-15
SH-13
P2AQ-6"
RH-18
HIGH TEMP ALARM SWITCH SEE REF# 18 SKETCH "B"
CONT ON REF#15 CONTAM STM
T-20 SEE REF#7
P5AP-3"
P5BF-3"
P3AB-5"
P3AL-5"
RH-12
X=60"(N)
X=6'-2"(F)
P3AK-5"
SH-23
SH-12 (FAR)
TR-5 (NEAR)
TR-4 (FAR)
CONTAMINATED ST GEN
FR 54
FR 50
FR 47
FR 44
FR 41
P2AR-6"
P2AM-6"
P2AN-6"
12'-8" OFF ℄ SHIP
H-SWING TYPE W/2 EX LEGS
SH-11 (FAR)
P3AA-5"
(FAR) P3AJ-5"
39'-0" OFF ℄ BHD
20'-9" OFF ℄ SHIP
X=25"
X=54"
X=68"
P3AD-5"
H-SWING TYPE W/2 EX LEGS
39'-9" OFF ℄ SHIP
X=55(F)
HOLE NEAR + FAR
HANDWHEEL DOWN
V-90
V131
R.H-11
MN LIGHTING TRANSFORMER
H-SWING TYPE
TR-3
P3AE-5"
50'-6" LVL
X=28"
R.H-10
SH-10
X=18"
X=10'-4"
P5BE-1½"
X=32"
P5Y-1½"
P5Z-1½"
ANCHOR F1
P1U-8"
AS-P1L-A
39'-0" OFF ℄ SHIP BHD
LIFT AREA
P1L-8"
24'-7" OFF ℄ SHIP
AS-P1L-B
CONT ON PLAN VIEW AFT
L.P. TURBINE
TELLTALE DRAIN
TR-6A
X=10'-4"
10'-3"
P3AF-5"
SH-27
P3AG-5"
H-11 W/EX LEG
P3AH-5" PORTABLE PIPE
"C1"
V-77 SET AT 242 PSIG
CONT ON PLAN VIEW FWD
P3AL-5"
P5BF-3"
P2AR-6"
P2AQ-6"
CONTAMINATED ST GENERATOR
F201 DESUPHTR TEMP CONTROL PILOT
G-64 SEE REF#6
P10-½"
V-4005
SBR51
P11-¼"
EXTERNAL DESUPHTR
V-155
V-151
V-157
V-135
P2AM-6"
BAND P11-½" TO THE INSUL. OD. OF THE ADJ. ST PIPE
P5AP-3"
V1
33'-0" LVL
CONT ON REF#15
"10-C"
"10"
"C"
H-SWING TYPE W/EX LEG
P9T-1"
CONT ON REF# 10 ATOM ST
H-SWING TYPE W/EX LEG Y=24"
P9-1"
15'-6" OFF ℄ SHIP
H-SWING TYPE
X=9"
SH-6 & TR-2
H-12 VERT & INVERTED
P40-4"
P9-1"
RH-7
P4P-4"
(FAR) SH-8
H-11 LEG INVERT PLANE, PERP TO ADD ANGLE TO LAND HGR
39'-0" OFF ℄ SHIP BHD
RH-9 & SH-9
P3A-5"
25'-9" OFF ℄ SHIP
P3B-5"
RH-8 & SH-7
P3C-5"
11'-0"
PORT BOILER
10
9
8
7
6
5

SECTION VIEW "10-A"
LKG AFT

PLAN VIEW BELOW 78'-4" FLAT FWD
"X" DIMENSIONS ARE TAKEN FROM 60'-0" FLAT &
"Y" DIMENSIONS ARE TAKEN FROM 33'-0" FLAT
UNLESS OTHERWISE NOTED.

6 450.737

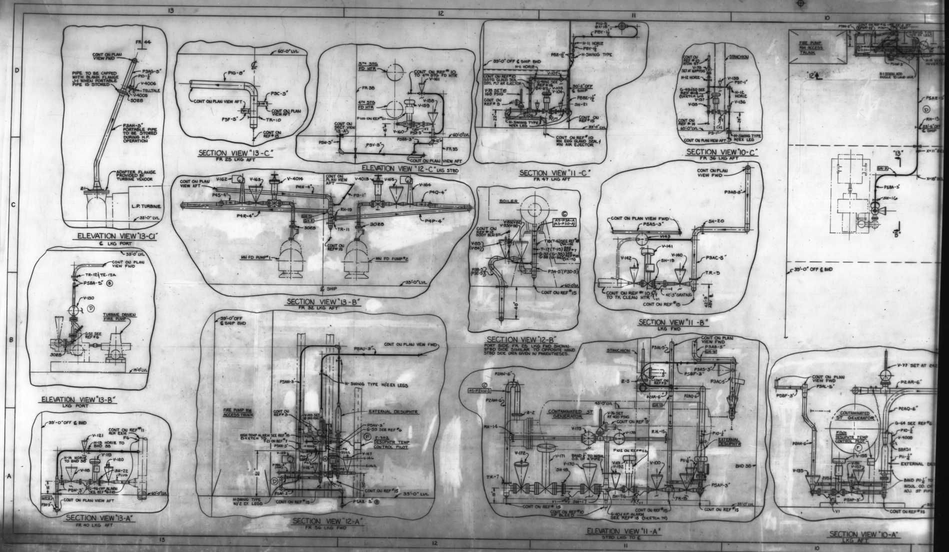
MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 2


13
12
11
10
D
C
B
A
FR 44
CONT ON PLAN VIEW FWD
PIPE TO BE CAPPED WITH BLANK FLANGE J-1 WHEN PORTABLE PIPE IS STORED
P3AG-5"
P10-½"
V-4006
TELLTALE
V-4005
3028
P3AH-5" PORTABLE PIPE TO BE STORED DURING H.P. OPERATION
ADAPTER FLANGE PROVIDED BY TURBINE VENDOR
L.P. TURBINE
33'-0" LVL
ELEVATION VIEW "13-C1"
℄ LKG PORT
60'-0" LVL
P1G-8"
P3C-5"
CONT ON PLAN VIEW AFT
CONT ON PLAN VIEW AFT
P3F-5"
TR-10
CONT ON REF# 15
SECTION VIEW "13-C"
FR 25 LKG AFT
5TH STG FD HTR
4TH STG FD HTR
CONT ON REF# 10 TO 4TH STG FD HTR
V-161
V-158
V-159
V-160
FR 38
FR 35
CONT ON SECT VIEW 13-A
P5W-3"
P5V-3"
P5BB-3"
60'-0" LVL
CONT ON PLAN VIEW AFT
ELEVATION VIEW "12-C" LKG STBD
P11-B
P8Y-1½"
P8Z-1½"
H-11 HORIZ
H-SWING TYPE
39'-0" OFF ℄ SHIP BHD
CONT ON REF# 10 5STG GLAND SEAL DSTL PLT AIR EJECTOR
V-107
V-105
V-104
SH-21
CONT ON REF# 9
H-SWING TYPE W/EX LEGS
CONT ON REF# 10 MN EUG GLAND SEAL MN AIR EJECTOR
33'-0" LVL
SECTION VIEW "11-C"
FR 47 LKG AFT
STANCHION
V-139
P3T-1"
H-12 HORIZ
V-137
V-138
V-136
CONT ON REF# 14
60'-0" LVL
P3-1"
H-SWING TYPE W/EX LEG
CONT ON PLAN VIEW AFT
SECTION VIEW "10-C"
FR 36 LKG AFT
FIRE PUMP RM ACCESS TRUNK
12'
"13"
P5BA-5"
SH-16
"B"
P5AE-5"
RH-13
X-11" BE
X-18" BE
CONT ON PLAN VIEW AFT
V-162
V-163
V-4014
CONT ON PLAN VIEW AFT
V-4013
V-165
V-164
P4S-4"
P4N-4"
P3-1"
P4Q-4"
P4R-4"
RH-19
P4P-4"
3028
TR-11
3028
CONT ON REF# 15
MN FD PUMP #1
MN FD PUMP #2
℄ SHIP
33'-0" LVL
SECTION VIEW "13-B"
FR 32 LKG AFT
BOILER
AS-P3A-A
AS-P3D-A
V-93
V-85
V-84
T-18
T-17
CONT ON REF# 15
P3A-5"(P3D-5)
60'-0" LVL
SECTION VIEW "12-B"
PORT SIDE FR 25 LKG FWD SHOWN STBD SIDE SIMILAR TO OPPOSITE HAND STBD SIDE DATA GIVEN IN PARENTHESES.
CONT ON PLAN VIEW FWD
P3AB-8"
CONT ON PLAN VIEW FWD
P5AS-3"
SH-20
V-143
V-141
V-142
SH-19
V-140
P3AC-5"
T.R.-5
CONT ON REF# 10 TO TK CLEAN HTR
CONT ON REF# 15
42'-3" GRATING
SECTION VIEW "11-B"
LKG FWD
33'-0" LVL
CONT ON PLAN VIEW FWD
TR-12
TR-12A
P5BA-5"
V-130
TURBINE DRIVEN FIRE PUMP
G-52 SEE REF# 6
3028
14'-0" LVL
ELEVATION VIEW "13-B"
LKG PORT
39'-0" OFF ℄ SHIP BHD
P5AU-3"
CONT ON PLAN VIEW FWD
P5AN-3"
H-SWING TYPE W/2 EX LEGS
EXTERNAL DESUPHTR
FIRE PUMP RM ACCESS TRUNK
CONT ON REF# 3
P5AV-3"
G-59 SEE REF# 6
HIGH TEMP ALARM SEE REF# 18
F-302 DESUPHTR TEMP CONTROL PILOT
V-167
V-166
CONT ON REF# 15
H-SWING TYPE W/2 EX LEGS
CONT ON REF# 15
P5AZ-3"
33'-0" LVL
SECTION VIEW "12-A"
FR 56 LKG FWD
35'-0" OFF ℄ BHD
CONT ON REF# 11 AUX EXH
V-121
H-13 HORIZ TO BHD 36
F6
V-119
H-14 HORIZ TO BHD 36
V-120
V-118
SH-22
PLUG
P5W-3"
G-46 CAP ALARM SEE REF# 18
CONT ON PLAN VIEW AFT
60'-0" LVL
P5V-3"
SECTION VIEW "13-A"
FR 40 LKG AFT
STANCHION
P3AL-5"
P3AB-5"
CONT ON PLAN VIEW FWD
P2AN-6"
AS-P2AN-D
P3AS-3"
P5BF-3"
P3AC-5"
P2AM-6"
Z-2
CONTAMINATED ST GENERATOR
43'-0" LVL
V-76 SET AT 400 PSIG
CONT ON REF# 3
RH-14
V-173
V-174
R.H.-15
P10-½"
EXTERNAL DESUPHTR
V-172
V-171
V-170
SH-18
BAND P11-½" TO INSUL O.D. OF 4" PIPE
F102 ON REF# 22
V-101
V-152
V-100
P11-½"
BHD 38
P5AF-3"
T.R.-7
V1
SH-17
SH-26
CONT ON REF# 15
CONT ON REF# 10 HP BLEED
G-404 HP ALARM SEE REF# 18
CONT ON REF# 15
CONT ON REF# 15
ELEVATION VIEW "11-A"
STBD LKG TO ℄
CONT ON PLAN VIEW FWD
P3AL-5"
P5BF-3"
V-77 SET AT
P2AR-6"
P2AQ-6"
CONTAMINATED ST GENERATOR
G-64 SEE REF# 6
F301 DESUPHTR TEMP CONTROL PILOT
P10-½"
V-4008
P2AN-6"
V-135
V-155
P11-½"
EXTERNAL DE
BAND P11-½" TO INSUL. OD. OF ADJ. ST PIPE
P5AP-3"
V1
CONT ON REF# 15
SECTION VIEW "10-A"
LKG AFT

6 450.737

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 3

10X

6450. 738

CSD Vault

E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 12-21-?
SIGNED J.H. Johnson

YARD PRINTS

ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS																							
REV.	H	H	E	F	D	F	H	B	G	C	B	B	B	A	A	A	B	G	B	B	G	G	G
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	8A	8B	9A	12A	14A	15A

GROUP
MC NO.

PARTIAL ISSUE
SHT 1, 2, 7 ONLY

NNS&DDCo HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C 613C	310 309	T11-S-116a	

DWG. REV. — HULL APPLIC.

REV.	613C	614C
A	YES	YES
B	YES	YES
C	YES	YES
D	YES	YES
E	YES	YES
F	YES	YES
G	YES	YES
H	YES	YES

APPROVALS
OWNERS
ABS NR
USCG NR

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689

COMMERCIAL SHIP DESIGN DEPT.

INSTALLATION GROUPS: 6450-0113-1102 PI
6450-0113-1103 SI
6450-0114-1004 SI
6450-0118-1005 SI
6450-0114-1006 PI
6450-0104-1007 SI

ARR DWG 6450-737
PIPE DET 6450-739

SCALE NONE = 1 Ft.
DRAWN E.R. SMOOT
CHECKED T.E. SEAMAN
SECT. MGR. J.H. Johnson
DATE COMPL. 4-28-76
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 4-28-76
TECH. APPROVAL NR
CSD APPROVAL R. L. Harrington

GROUPED BY CHK.
DATES COMP. PART
HULL 613C, 614C GROUP NO. KEY
TYPE OF DWG.

TITLE
PIPING ARR BOILER PRESSURE
AUXILIARY STEAM-LIST OF MAT'L

DWG. NO. 6450-738 REV H SHEET NO. 1 OF 17

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D.	OWNER DATE	OWNER APPD.
A	—	INITIAL ISSUE RJP	4/28/76	J.H.J.	—	—
	13	ADDED V4013 & V4014 AND L.17. RJP				
B	8A,8B 9,9A 12A,14A 15A,17	ADDED SHTS 8A & 8B. SHT 9- ADDED LINES 15-18. ADDED SHTS 9A, 12A, 14A & 15A. SHT 17- ADDED LINE NO. 7. WJG				
	7,11	SHT 7- ADDED L.11. SHT 11- ADDED LINES 15-17. WJG RJP				
	8	JOINT SIZE OF Z2 ALT'D TO 6" WAS 3" AND QTY OF LN 7&8 INCREASED TO 12 WAS 8. LENGTH OF LN 7 INCREASED TO 4" WAS 3½".				
	4 5 6	LN 4,5,&6 PIPE NO. ALTD. SIZE OF V-77 & V-76 ADDED, (LN 1+9). SIZE OF V-140 ADDED, (LN 7).	6/6/7	AC J.H.J.	—	—
C	10	LINES 11 & 12 ADDED	8/17/7	J.H.J.		
D	4 5 7 8A	ALT'D LINES 4 THRU 6 ALTERED LINE 3. QTY OF LINE 5 WAS 7. ALT'D LINES 6 & 15. WJG	2/24/8	J.H.J.	—	—
E	3	ALT'D WALL THK FOR LINES 4 & 5	4/20/8	AC J.H.J.		
F	6 4	~~DELETED LINE 10~~ GER ADDED LINES 14 & 15	3/29/8	AC J.H.J.		
G	8A 9 12A 14A 15A	ADDED HOT LOADS & VERT MOVE TO L'S 1 THRU 12 L. 15 L'S 1 THRU 4 L'S 1 THRU 5 L'S 1 THRU 4 WJG	10/26/8	AC J.H.J.		
H	7	QTY OF L.9 WAS 3. ADDED L.12. (WORK ACCOMP ON 613C BY LIAISON NO. 613C-JHJ-67) WJG	2/21/9	AC J.H.J.		

NOTES
1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF #1.

NO.	REFERENCES	DWG. NO.
1	DIAGRAM - AUX STEAM SYS - L/M	6450-684

HULL NO. 613C, 614C
DWG. NO. 6450-738 REV H SHEET 2 OF —

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1U	8" IPS x "X" HVY THK PIPE STL	PIPE DETAIL 6450-739	PS	
	ASSY #10	2	1	P2AM	6" IPS ↓	↓	↓	
		3	1	P2AN	↓	↓	↓	
E		4	1	P2AQ	STD THK	↓	↓	
E		5	1	P2AR	↓	↓	↓	
		6	1	P3AA	5" IPS x "X" HVY	↓	↓	
		7	1	P3AB	↓	↓	↓	
	ASSY #9	8	1	P3AC	↓	↓	↓	
		9	1	P3AD	↓	↓	↓	
		10		P3AJ	↓	↓	↓	
		11		P3AK	↓	↓	↓	
		12		P3AL	↓	↓	↓	
	ASSY #11	13		P5AP	3" IPS	↓	↓	
		14	1	P5AS	↓	↓	↓	
		15	1	P5AT	↓	↓	↓	
		16	1	P5AU	↓	↓	↓	
	ASSY #12	17	1	P5AV	↓	↓	↓	
		18	1	P5AW	↓	↓	↓	

REMARKS -

SERVICE - BOILER PRESS AUX ST
APPLICABLE HULLS 613C 614C
GROUP NO. PS-162 6450-0104-1007 SI SHT 1 OF 8
DWG NO. 6450-738 SHEET 3 REV. E

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P5AX	3" IPS x "X" HVY THK PIPE STL	PIPE DETAIL 6450-739	PS	
		2	1	P5BF	↓	↓	↓	
		3	1	P7BG	2" IPS	↓	↓	
D		4	1	P5AY	3" IPS	↓	↓	
D		5	1	P5AZ	↓	↓	↓	
D		6	1	P5BA	↓	↓	↓	
		7						
		8						
		9						
		10						
		11	30'	P10	½" IPS x "X" HVY THK PIPE STL	K57-07-102	PS	
		12	30'-0"	P11	¼" IPS ↓	K57-07-100	↓	
		13						
F		14	1	F-301	TEMPERATURE CONTROLLER (STM TO CONTAM STM)	PO ⑨ 6450-C12	ST-PS	
F		15	1	F302	↓ (STM TO STRIP PMP)	⑪ ↓	↓	
		16						
		17						
		18						

REMARKS -

SERVICE - BOILER PRESS AUX ST
APPLICABLE HULLS 613C 614C
GROUP NO. PS-162 6450-0104-1007 SI SHT 2 OF 8
DWG NO. 6450-738 SHEET 4 REV. F

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	VALVE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	1	V-77	6"x8" ANGLE RELIEF 300#x 150# FLG STL (SET @ 242 PSIG)	PO ③A 6450-C7	MD-PS	
		2	1	V-90	5" GATE 600# B.W. STL (MOTOR OPER)	PIPE DET 6450-739	PS	
D		3	1	V-130	3" GLOBE STOP 600# B.W. STL	↓	↓	
		4	1	V-131	5" ↓ B.W.	↓	↓	
	ASSY #9	5	1	V-140	3" ↓ B.W.	↓	↓	
		6	1	V-141	3" PRESS TEMP CONT 600# FLG STL	↓	↓	
		7	1	V-142	3" GATE 600# B.W. STL	↓	↓	
		8	1	V-143	3" GLOBE STOP 600# B.W. STL	↓	↓	
B	ASSY 10	9	1	V-76	4"x6" ANGLE RELIEF 600#x 150# FLG STL (SET @ 400 PSIG)	↓	↓	
		10	1	V-100	3" GLOBE STOP 600# B.W. STL	↓	↓	
		11	1	V-101	3" PRESS RED 600# FLG	↓	↓	
		12	1	V-170	6" GLOBE STOP 300# FLG	↓	↓	
		13	1	V-171	8" FLOW CONT	↓	↓	
		14	1	V-172	6" GATE	↓	↓	
		15	1	V-173	4" GLOBE STOP	↓	↓	
		16	1	V-178	3" ↓ 600# B.W.	↓	↓	
		17	1	V-192	3" GATE	↓	↓	
	ASSY #11	18	1	V-135	4" GLOBE	↓	↓	

REMARKS -

SERVICE - BOILER PRESS AUX ST
APPLICABLE HULLS 613C 614C
GROUP NO. PS-162 6450-0104-1007 SI SHT 3 OF 8
DWG NO. 6450-738 SHEET 5 REV. D

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	VALVE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	ASSY #11	1	1	V-155	3" PRESS RED 600# FLG STL	ON PIPE DET 6450-739	PS	
		2	1	V-157	3" GLOBE STOP B.W.	↓	↓	
		3	1	V-191	3" GATE	↓	↓	
	ASSY #12	4	1	V-129	2½" ↓	↓	↓	
		5	1	V-146	1" PRESS RED. FLG	↓	↓	
		6	1	V-147	3" GATE B.W.	↓	↓	
B		7	1	V-149	2×3" ANGLE RELIEF 300#×150# FLG, STL (SET @ 245 PSIG)	↓	↓	
		8	1	V-176	2" GLOBE STOP 600# S.W. STL	↓	↓	
		9	1	V-177	1¼"	↓	↓	
F		10	1	~~V-4007~~	~~½"~~	~~PO ②~~ 6450-C9	MD-PS	
		11	1	V-4008	½"	PO ② 6450-C9	↓	
		12	1	V-4009	↓	↓	↓	
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - BOILER PRESS AUX ST
APPLICABLE HULLS 613C 614C
GROUP NO. PS-162 6450-0104-1007 SI SHT 4 OF 8
DWG NO. 6450-738 SHEET 6 REV. F

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	2	80WS2	8" BACKING RING STL (X-HVY)	97-18-138	ST-PS	
		2	2	60WS2	6" ↓	25-20-948	↓	
		3	7	50WS2	5" ↓	25-20-942	↓	
		4	3	40WS2	4" ↓	25-20-934	↓	
D		5	10	30WS2	3" ↓	25-20-922	↓	
		6	3	24WS2	2½" ↓	25-20-916	↓	
		7	1	20WS2	2" ↓	25-20-910	↓	
		8	3	5BRS1	½"×¼" INSERT RED 3000# S.W. STL	PO ㊶ 6200-M12	MD-PS	
H		9	4	2US2	¼" UNION SCR'D 3000# STL	㊸ ↓	↓	
		10	1	F1	8" INSULATED BHD CONN (87) 216522	MO 216686 S3 L1	ST-PS	
B		11	59'-0"	F-2	3×3×⅜ ANGLE STL	MO 257726 S.3 L.14	↓	
H		12	2	F-5	¼" PULSATION DAMPENER BRONZE SCREWED	S/ 26-02-240	↓	
H		13	1	F-6	½" BOSS S.W. STL.	S 25.02-222	↓	
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - BOILER PRESS AUX ST
APPLICABLE HULLS 613C 614C
GROUP NO. PS-162 6450-0104-1007 SI SHT 5 OF 8
DWG NO. 6450-738 SHEET 7 REV. H

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1				BOLT STUD				
	2				NUTS				
	3				GSKT				
	4	8	3028	3"	BOLT STUD	¾" CONTINUOUS THD L=5"	21-18-572	ST-PS	
	5	16			NUTS	¾" HVY HEX	6000-C11 ③	MD-PS	
	6	1			GSKT	FLEXITALIC STYLE CG 600#	15.04-112	ST-PS	
B	7	12	Z2	6"	BOLTS	¾" HVY HEX HEAD L= 4"	6000-C7 ㉑	MD-PS	
B	8	12			NUTS	¾" HVY HEX	6000-C11 ③	↓	
	9	1			GSKT	1/16" COMPRESSED ASBESTOS	15.01-274 E	ST-PS	
	10	8	Z3	4"	BOLTS	¾" HVY HEX HEAD L=3½"	6000-C7 ⑳	MD-PS	
	11	8			NUTS	¾" HVY HEX	6000-C11 ③	↓	
	12	1			GSKT	1/16" COMPRESSED ASBESTOS	15.01-278 E	ST-PS	
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17		○		NUTS				
	18				GSKT				
	19				BOLTS				
	20		○		NUTS				
	21				GSKT				
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

REMARKS -

SERVICE - BOILER PRESS AUX ST
APPLICABLE HULLS 613C 614C
GROUP NO. PS-162 6450-0104-1007 SI SHT 6 OF 8
DWG NO. 6450-738 SHEET 8 REV. B

HANGER INSTALLATION GROUP

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER NR	SIZE	HOT LOAD	VERT MOVE COLD-HOT	MAT'L SOURCE		ROUTING	MAT'L RECORD
G		1	1	SH-11	5	195 / 195	.5" UP	PO ㊳ 6552-C16		MD-PS	
↓		2	1	12	5"	615	.44" UP	㊴		↓	
↓		3	1	13	3"	433	.15" DN	㊵		↓	
↓		4	1	14	3"	388	.09" DN	㊶		↓	
↓		5	1	15	6"	407	.26" UP	㊷		↓	
↓		6	1	16	3"	259 / 259	.63" UP	PO ⑤ 6450-C62		↓	
↓		7	1	17	6"	484	.28" DN	PO ㊹ 6552-C16		↓	
↓		8	1	18	—	1147	.27" DN	㊺		↓	
↓		9	1	19	—	664	.91" DN	㊻		↓	
↓		10	1	20	5"	498	.67" DN	㊼		↓	
↓		11	1	23	3"	170	.34" UP	㊿		↓	
↓		12	1	26	—	526	.26" DN	(53)		↓	
		13	1	RH-11	5" ROD HANGER ASSY			MO 257726 S.12	L.12	ST-PS	
		14	1	12	5"			S.13	L.1	↓	
D		15	1	13 *	3"			S.13	L7	↓	
		16	1	14	6"			S.14	L.1	↓	
		17	1	15	3"			S.13	L.10	↓	
		18	1	16	3"			S.14	L.7	↓	

REMARKS - * X42 TO REPLACE EXISTING 2½" PIPE CLAMP WITH 3" PIPE CLAMP (S/25-43-396)

SERVICE - BOILER PRESS AUX ST
APPLICABLE HULLS 613C 614C
GROUP NO. PS-162 6450-0104-1007 SI SHT 7 OF 8
DWG NO. 6450-738 SHEET 8A REV. G

6450-738

MICRO-MASTER® 105 mm
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SEPT. '80
FRAME
8X

HANGER INSTALLATION GROUP

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	RH-18	3" ROD HANGER ASSY	MO 257726 S.14 L.7	ST-PS	
		2	1	TR-4	5" TIE ROD ASSY	S.16 L.9		
		3	1	5	5"	S.17 L.1		
		4	1	7	6	S.18 L.1		
		5	1	8	4	S.18 L.4		
		6	1	9	5"	S.18 L.7		
		7	1	12	2½"	S.19 L.7		
		8	1	12A		S.19 L.13		
B		9	1	H-11	5" SWING TYPE HGR W/2 EXTRA LEGS w/¼" Liner	25-46-426		
		10	1	H-14	3" SWING TYPE HGR W/2 EX LEGS w/¼" Liner	25-49-396		
		11	5	H-11	3" SWING TYPE HGR W/EX LEG w/¼" Liner	25-46-396		
		12	1	H-14	2½" SWING TYPE HGR w/¼" Liner	25-49-386		
		13	2	H-1	2" FIXED TYPE HGR W/¼" Liner	25-40-376		
		14	1	H-11	2" SWING TYPE HGR W/2 EX LEGS w/¼" Liner	25-46-376		
		15	1	H-12	2" SWING TYPE HGR w/¼" Liner	25-47-376		
		16	2	H-11	2½" SWING TYPE HGR W/2 EX LEGS w/¼" Liner	25-46-386		
		17						
		18						

REMARKS -

SERVICE - BOILER PRESS AUX ST

GROUP NO. PS-162

6450-0104-1007 SI
SHT 8 OF 8

APPLICABLE HULLS 613C 614C

DWG NO. 6450-738 SHEET 8B REV. B

INSTALLATION GROUP

NN 3569

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1K	8"IPS × "X" HVY THK PIPE STL	PIPE DET 6450-739	PS	
		2	1	P1L	8"IPS			
		3	1	P5V	3"IPS			
		4	1	P5BB	3"IPS			
		5	1	P5BC	3"IPS			
		6	1	P5BD	3"IPS			
		7						
		8						
		9						
		10		FITTING NO.				
		11	2	80WS2	8"BACKING RING STL("X" HVY)	97-18-138	ST-PS	
		12	4	30WS2	3"	25-20-922		
		13						
		14						
G		15	1	SH-1	SIZE 3"; HOT LOAD 112; VERT MOVE COLD-HOT .14DN	PO ㉘ 6552-C16	MD-PS	
B		16	1	RH-1	3" ROD HANGER ASSY	MO 257726 S.7 L.13	ST-PS	
B		17	1	RH-2	8" ROD HANGER ASSY	MO 257726 S.8 L.14		
B		18		H-57	3" SWING TYPE HGR w/¼" Liner	MO 257726 S.20 L.11		

REMARKS -

SERVICE - BOILER PRESS AUX ST

GROUP NO. PS-152

6450-0113-1102 PI
SHT 1 OF 2

APPLICABLE HULLS 613C 614C

DWG NO. 6450-738 SHEET 9 REV. G

INSTALLATION GROUP

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	1	H-11	3" SWING TYPE HGR w/¼" LINER	25-46-396	ST-PS	
B		2	1	H-11	8" SWING TYPE HGR w/¼" Liner	25-46-496		
B		3	5	H-11	3" SWING TYPE HGR W/EX LEG w/¼" Liner	25-46-396		
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - BOILER PRESS AUX ST

GROUP NO. PS-152

6450-0113-1102 PI
SHT 2 OF 2

APPLICABLE HULLS 613C 614C

DWG NO. 6450-739 SHEET 9A REV. B

INSTALLATION GROUP

NN 3569

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3AE	5"IPS × "X" HVY THK PIPE STL	PIPE DET 6450-739	PS	
		2	1	P3AF				
		3	1	P3AG				
		4	1	P3AH				
	ASSY #6	5	1	P5W	3"IPS			
	ASSY #7	6	1	P5X				
		7	1	P8Y	1½"IPS			
		8	1	P8Z				
	ASSY #8	9	1	P8BE				
		10	12"	P10	½"IPS			
		11	4	V1	1" G.S.V. STL. S.W. 600#	PO ⑧ 6450-C9	MD-PS	
		12	5	V2	½" G.S.V. STL. S.W. 600#	PO ② 6450-C9		
		13	1	V-118	3"GLOBE STOP 600#B.W.STL	PIPE DET 6450-739	PS	
	ASSY #6	14	1	V-119	2" PRESS RED 600# FLG STL			
		15	1	V-120	3" GATE 600# B.W. STL			
		16	1	V-121	2"GLOBE STOP 600#S.W.STL			
	ASSY #7	17	1	V-158	3" ANGLE STOP 600# B.W. STL			
		18	1	V-159	2"PRESS RED 600# FLG STL			

REMARKS -

SERVICE - BOILER PRESS AUX ST

GROUP NO. PS-166

6450-0113-1103 SI
SHT 1 OF 4

APPLICABLE HULLS 613C 614C

DWG NO. 6450-738 SHEET 10 REV. C

INSTALLATION GROUP

NN 3569

REV.		LINE NO.	QTY (1 SHIP)	VALVE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	#7	1	1	V-160	3"GATE 600# B.W. STL	PIPE DET 6450-739	PS	
	ASSY	2	1	V-161	2"GLOBE STOP 600#S.W.STL			
		3	1	V-76	2"x 3" ANGLE RELIEF 300#x 150# FLG, STL (SET @ 168 PSIG)			
	#8	4	1	V-104	1½" GLOBE STOP 600# S.W. STL			
	ASSY	5	1	V-105	1" PRESS RED 600# FLG STL			
		6	1	V-106	1½" GATE 600# S.W. STL			
		7	1	V-107	1½" GLOBE STOP 600# S.W. STL			
		8	1	V-4005	½"			
		9	1	V-4006				
		10						
		11		FITTING NO.				
		12	2	50WS2	5"BACKING RING STL("X" HVY)	25-20-942	ST-PS	
		13	4	30WS2	3"	25-20-922		
		14	1	J-1	5" BLANK FLANGE 600# STL	PO ㉗ 6450 C34	MD-PS	
B		15	1	F-3	HANGER SUPPORT FOR TR6 & TR6A	MO 257726 S.3 L.15	ST-PS	
B		16	14'-0"	F-2	3x3x⅜ ANGLE STL	S.3 L.14		
B		17	1	F-4	SPECIAL HANGER	MO 257726 S.9 L.14		
		18						

REMARKS -

SERVICE - BOILER PRESS AUX ST

GROUP NO. PS-166

6450-0113-1103 SI
SHT 2 OF 4

APPLICABLE HULLS 613C 614C

DWG NO. 6450-738 SHEET 11 REV. B

FLANGED JOINT LIST & INSTALLATION GROUP

NN 3569

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	8	5028	5"	BOLT STUD	1"CONTINUOUS THD L=6¾"	21-18-631	ST-PS	
	2	16			NUTS	1" HVY HEX	6000-C11 ⑤	MD-PS	
	3	1			GSKT	FLEXITALIC STYLE CG 600#	15-04-118	ST-PS	
	4	12	21	8"	STUDS	1⅛" CONTINUOUS THD L=6"	21-18-650		
	5	12			NUTS	1⅛" HVY HEX	6000-C11 ⑨	MD-PS	
	6	1			GSKT	FLEXITALIC STYLE CG 600#	15-04-122	ST-PS	
	7		○		BOLTS				
	8				NUTS				
	9				GSKT				
	10		○		BOLTS				
	11				NUTS				
	12				GSKT				
	13		○		BOLTS				
	14				NUTS				
	15				GSKT				
	16		○		BOLTS				
	17				NUTS				
	18				GSKT				
	19		○		BOLTS				
	20				NUTS				
	21				GSKT				
	22		○		BOLTS				
	23				NUTS				
	24				GSKT				
	25		○		BOLTS				
	26				NUTS				
	27				GSKT				
	28		○		BOLTS				
	29				NUTS				
	30				GSKT				
	31		○		BOLTS				
	32				NUTS				
	33				GSKT				
	34		○		BOLTS				
	35				NUTS				
	36				GSKT				
	37		○		BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - BOILER PRESS AUX ST

GROUP NO. PS-166

6450-0113-1103 SI
SHT 3 OF 4

APPLICABLE HULLS 613C 614C

DWG NO. 6450-738 SHEET 12 REV. B

HANGER INSTALLATION GROUP

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
G		1	1	SH-10	SIZE 5"; HOT LOAD 293; VERT MOVE COLD-HOT .47"DN	PO ㊲ 6552-C16	MD-PS	
		2	1	21	—; 156; .03 DN	㊽		
		3	1	22	—; 333; .05UP	㊾		
		4	1	27	5"; 268; .55"UP	(54)		
		5	1	RH-10	5" ROD HANGER ASSY	MO 257726 S.12 L.6	ST-PS	
		6	1	TR-3	5" TIE ROD ASSY	S.16 L.6		
		7	1	6	5"	S.17 L.7		
		8	1	6A	5"	S.17. L.13		
B		9	1	H-11	3" SWING TYPE HGR W/EX LEG w/¼" Liner	25-46-396		
B		10	1	H-13	2" SWING TYPE HGR w/¼" Liner	25-48-376		
		11	1	H-57	2" SWING TYPE HGR w/¼" Liner	MO 257726 S.20 L.4		
B		12	1	H-11	5" SWING TYPE HGR W/EX LEG w/¼" Liner	25-46-426		
B		13	4	H-11	1½" SWING TYPE HGR w/¼" Liner	25-46-366		
B		14	1	H-14	3" SWING TYPE HGR w/¼" Liner	25-49-396		
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

GROUP NO. PS-166

6450-0113-1103 SI
SHT 4 OF 4

APPLICABLE HULLS 613C 614C

DWG NO. 6450-738 SHEET 12A REV. G

INSTALLATION GROUP

NN 3569

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P4M	4"IPS × "X" HVY THK PIPE STL	PIPE DET 6450-739	PS	
		2	1	P4N				
		3	1	P4P				
	ASSY #3	4	1	P4Q				
		5	1	P4R				
	ASSY #4	6	1	P4S				
		7	3'-0"	P9	1" IPS	K57-07-104		
		8						
		9		VALUE NO.				
	#4	10	1	V-162	4"GATE 600# B.W. STL MOTOR OPER	PIPE DET 6450-739	PS	
	ASSY	11	1	V-163	4"GLOBE STOP 600# B.W. STL			
		12	1	V-164	4"GATE 600# B.W. STL MOTOR OPER			
	ASSY #3	13	1	V-165	4"GLOBE STOP 600# B.W. STL			
B		14	1	V-4013	3"CONTROL 600# FLG STL			
B	ASSY #4	15	1	V-4014	3"CONTROL 600# FLG STL			
		16		FITTING NO.				
B		17	6'-0"	F-2	3x3x⅜ ANGLE STL	MO 257726 S.3 L.14	SF-PS	
		18	6	40WS2	4"BACKING RING STL("X" HVY)	25-20-934		

REMARKS -

SERVICE - BOILER PRESS AUX ST

GROUP NO. PS-167

6450-0114-1004 SI
SHT 1 OF 3

APPLICABLE HULLS 613C 614C

DWG NO. 6450-738 SHEET 13 REV. B

FLANGED JOINT LIST & INSTALLATION GROUP

NN 3569

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	16	3028	3"	BOLT STUD	¾" CONTINUOUS THD L=5"	21-18-572	ST-PS	
	2	32			NUTS	¾" HVY HEX	6000-C11 ③	MD-PS	
	3	2			GSKT	FLEXITALIC STYLE CG 600#	15-04-112	ST-PS	
	4		○		BOLTS				
	5				NUTS				
	6				GSKT				
	7		○		BOLTS				
	8				NUTS				
	9				GSKT				
	10		○		BOLTS				
	11				NUTS				
	12				GSKT				
	13		○		BOLTS				
	14				NUTS				
	15				GSKT				
	16		○		BOLTS				
	17				NUTS				
	18				GSKT				
	19		○		BOLTS				
	20				NUTS				
	21				GSKT				
	22		○		BOLTS				
	23				NUTS				
	24				GSKT				
	25		○		BOLTS				
	26				NUTS				
	27				GSKT				
	28		○		BOLTS				
	29				NUTS				
	30				GSKT				
	31		○		BOLTS				
	32				NUTS				
	33				GSKT				
	34		○		BOLTS				
	35				NUTS				
	36				GSKT				
	37		○		BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - BOILER PRESS AUX ST

GROUP NO. PS-167

6450-0114-1004 SI
SHT 2 OF 3

APPLICABLE HULLS 613C 614C

DWG NO. 6450-738 SHEET 14 REV. A

6450-738

MICRO-MASTER® 105 mm

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SEPT. '80

FRAME

8X

6450-738

MICRO-MASTER 105 mm
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FRAME

8X

HANGER INSTALLATION GROUP

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER Nº	DESCRIPTION: SIZE	HOT LOAD	VERT MOVE COLD-HOT	MAT'L SOURCE	ROUTING	MAT'L RECORD
G		1	1	SH-3	4'	721	.21" UP	PO ㉚ 6552-C16	MD-PS	
		2	1	SH-4	4"	326	.15" UP	㉛		
		3	1	SH-5	3"	721	.05" UP	㉜		
		4	1	SH-6	4"	326	.35" UP	㉝		
		5	1	SH-25	4"	231	.08" DN	(52)		
		6	1	RH-19	4' ROD HANGER ASSY			NO 257726 S.15 L.7	ST-PS	
		7	1	TR-1	4 TIE ROD ASSY			S.15 L.14		
		8	1	TR-2	4			S.16 L.1		
		9	1	TR-11	4'			S.19 L.1		
		10	1	TR-13	4"			S.20 L.1		
		11	1	SH-8	4" SPRING HGR ASSY			PO ㉟ 6552-C16	MD-PS	
B		12	4	H-12	1" SWING TYPE HGR w/ 1/4" LINER			25-47-346	ST-PS	
B		13	2	H-11	1" SWING TYPE HGR w/ 1/4" LINER			25-46-346		
B		14	4	H-11	1" SWING TYPE HGR W/EX LEG w/ 1/4" LINER			25-46-346		
		15								
		16								
		17								
		18								

REMARKS –

SERVICE - BOILER PRESS AUX ST

GROUP NO.	PS-167 6450-0114-1004 SI SHT 3 OF 3		
APPLICABLE HULLS: 613C 614C	DWG NO. 6450-738	SHEET 14A	REV. G

INSTALLATION GROUP

NN 3569

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1G	8" IPS x "X" HVY THK PIPE STL	PIPE DET 6450-739	PS	
		2	1	P1H				
		3	1	P1J				
		4	1	P3B	5' IPS			
		5	1	P3C				
		6	1	P3E				
		7	1	P3F				
		8						
		9		FITTING NO.				
		10	3	80WS2	8" BACKING RING STL (X' HVY)	97-18-138	SF-PS	
		11	4	50WS2	5"	25-20-942		
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE - BOILER PRESS AUX ST

GROUP NO.	PS-152 6450-0114-1006 PI SHT 1 OF 2		
APPLICABLE HULLS: 613C 614C	DWG NO. 6450-738	SHEET 15	REV. A

HANGER INSTALLATION GROUP

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	HANGER Nº	DESCRIPTION: SIZE	HOT LOAD	VERT MOVE COLD-HOT	MAT'L SOURCE	ROUTING	MAT'L RECORD
G		1	1	SH-2	5	221	.98" DN	PO ㉙ 6552-C16	MD-PS	
		2	1	7	5"	219	.98" DN	㉞		
		3	1	9	5"	359	.83" DN	㊱		
		4	1	24	5"	359	.83" DN	㉛		
		5	1	RH-3	8" ROD HANGER ASSY			NO 257726 S.10 L.1	ST-PS	
		6	1	4	8"			S.10 L.7		
		7	1	5	5"			S.10 L.13		
		8	1	6	8			S.11 L.1		
		9	1	8	5"			S.11 L.13		
		10	1	9	5"			S.12 L1		
		11	1	17	5"			S.14 L.13		
		12	1	TR-10	8" TIE ROD ASSY			S.18 L.13		
B		13	1	H-11	8" SWING TYPE HGR W/2 EX LEGS w/ 1/4" LINER			25-46-446		
		14								
		15								
		16								
		17								
		18								

REMARKS –

SERVICE –

GROUP NO.	PS-152 6450-0114-1006 PI SHT 2 OF 2		
APPLICABLE HULLS: 613C 614C	DWG NO. 6450-738	SHEET 15A	REV. G

INSTALLATION GROUP

NN 3569

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	ASSY #1	1	1	P3A	5' IPS x 'X' HVY THK PIPE STL	PIPE DET 6450-739	PS	
	ASSY #2	2	1	P3D				
	ASSY #3	3	1	P9T	1" IPS			
		4						
		5		VALVE NO.				
	ASSY #1	6	1	V-83	5' ANGLE STOP CHECK 600# B.W. STL	PIPE DET 6450-739	PS	
		7	1	V-85	5" GATE 600# B.W. STL			
		8	1	V-93	2" GLOBE STOP 600# S.W. STL			
	ASSY #2	9	1	V-82	5" ANGLE STOP CHECK 600# B.W. STL			
		10	1	V-84	5" GATE 600# B.W. STL			
		11	1	V-91	2" GLOBE STOP 600# S.W. STL			
	ASSY #5	12	1	V-79	1 1/2" x 2" ANGLE RELIEF 300# x 150# FLG STL (SET @ 168 PSIG)			
		13	1	V-136	1" GLOBE STOP 600# S.W. STL			
		14	1	V-137	1" PRESS RED FLG			
		15	1	V-138	1" GATE S.W.			
		16	1	V-139	1" GLOBE STOP			
		17						
		18						

REMARKS –

SERVICE - BOILER PRESS AUX ST

GROUP NO.	PS-173 6450-0118-1005 SI SHT 1 OF 2		
APPLICABLE HULLS: 613C 614C	DWG NO. 6450-738	SHEET 16	REV. A

INSTALLATION GROUP

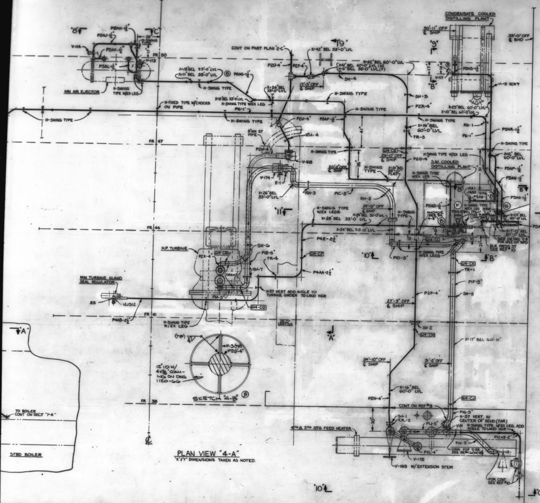
NN 3569

REV.		LINE NO.	QTY (1 SHIP)	FITTING NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	2	60WS2	6" BACKING RING STL (X-HVY)	25-20-948	ST-PS	
		2	2	50WS2	5"	25-20-942		
		3						
		4						
		5						
		6		HANGER Nº				
B		7	1	RH-7	1" ROD HANGER ASSY	NO 257726 S.11 L.7	ST-PS	
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

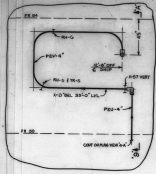
REMARKS –

SERVICE - BLR PRESS AUX ST

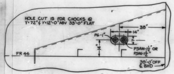
GROUP NO.	PS-173 6450-0118-1005 SI SHT 2 OF 2		
APPLICABLE HULLS: 613C 614C	DWG NO. 6450-738	SHEET 17	REV. B


"B"
PSAH-1½"
"C"
V-116
PSAJ-1½"
H-SWING TYPE
FR 50
V-113
PSAK-1½"
PSAL-1½"
X=18'BEL 33'-0" LVL
X=11' BEL 33'-0" LVL
PSAG-1½"
MN AIR EJECTOR
H-SWING TYPE W/EX LEG
CONT ON PART PLAN "2-C"
X=42" BEL 33'-0" LVL
"9"
CONDENSATE COOLED DISTILLING PLANT
30'-11" OFF ℄ SHIP
39'-0" OFF ℄ BHD
P2U-4"
PCT-4"
SH-4
17'-3" OFF ℄ SHIP
V-117
PSAS-1½"
H-15 VERT
H-FIXED TYPE W/CHOCKS ON PIPE
H-SWING TYPE W/EX LEG
PG-1"
H-SWING TYPE
SH-3
P2R-4"
X=25' BEL 60'-0" LVL
X=10' BEL 60'-0" LVL
RH-1
PSAR-1½"
PSAF-1½"
TR-3
PG-1"
H-SWING TYPE
FR 47
8" MN ST PIPE
P2W-4"
V-168
SH-4
H-SWING TYPE W/EX LEG
S.W. COOLED DISTILLING PLANT
P2Q-4"
PSAP-1½"
PSAN-1½"
20'-8" OFF ℄ SHIP
V-174
RH-3
PIC-5"
RH-2
"11"
H-SWING TYPE W/EX LEGS
X=26' BEL 33'-0" LVL
X=28' BEL 33'-0" LVL
"B"
PSAM-1½"
FR 44
X=34' BEL 33'-0" LVL
P4Z-2½"
H.P. TURBINE
P2X-4"
SH-6
P1B-5"
TR-4
"10"
P1D-5"
"B"
SH-7
P4AA-2½"
TR-1
P1F-5"
MN TURBINE GLAND SEAL REGULATOR
H-57 VERT ADD ANGLE TO TURBINE GIRDER TO LAND HGR
P1A-5"
SH-5
P2P-4"
27'-3" OFF ℄ SHIP
FR 41
P4AB-2½"
H-SWING TYPE W/EX LEG
"A"
"A"
SH-2
X=17' BEL 60'-0"
24'-10" OFF ℄ SHIP
31'-2" OFF ℄ SHIP
X=16' BEL 60'-0" LVL
SKETCH "4-B"
P2N-4"
FR 38
CONT ON REF #9
TO BOILER CONT ON SECT "7-A"
SH-1
TR-2
H-57 VERT IN CENTER OF BEND (FAR)
H-SWING TYPE W/EX LEG, ADD ANGLE TO LAND HGR
4TH & 5TH STG FEED HEATER
P1K-5"
P2L-4"
V-175
V-169 W/EXTENSION STEM
FOR CONT SEE REF #10
STBD BOILER
"10"
"C"

PLAN VIEW "4-A"
"X" & "Y" DIMENSIONS TAKEN AS NOTED.


"A"
FR 64
RH-6
45"
P2V-4"
12'-8" OFF ℄ SHIP
RH-5 & TR-5
H-57 VERT
X=21' BEL 33'-0" LVL
P2U-4"
FR 50
CONT ON PLAN VIEW "4-A"
"9"

PART. PLAN VIEW "2-C"


HOLE CUT IS FOR CHOCKS @ Y=72" & Y=12'-0" ABV 33'-0" FLAT
38"
14"
PG-1"
PSAM-1½" OR PSAN-1½"
FR 44
39'-0" OFF ℄ BHD

DETAIL "2-B"
SCALE: ½"=1'-0"

REVISIONS						
REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTH'D	OWNER DATE	OWNER APP'D
A	ALL	INITIAL ISSUE	5/13/76			
B	ALL	DRAWING HAS BEEN GENERALLY REVISED TO SUIT DESIGN DEVELOPMENT	4/6/77		—	—
	ALL	PIPE SUPPORTS ADDED TO SUIT E.T. COMMENTS				
	4-D	ALT PSAG, PSAF-1½" TO CLEAR STRUCTURE				
	3C	ADDED TAKE DOWN FLANGES IN PIC-5" FOR CONDENSER OVERHAUL				
	1-D	ALT'D NOTE NO. 4.				
C	7C	ADDED LOOP SEAL TO SENSING LINE FOR V-141	1/19/78		—	—
	11B	ADDED LOOP SEAL TO SENSING LINE FOR V-105				
		ADDED SKETCH NOS WHERE REF #16 IS USED				
D	3A 10C	DELETED SENSING LINE FOR V-159	5/16/78		—	—
E	11-B	ADDED V4043, V4044, V4045, F4 & F5. (THIS TO SUIT DESIGN DEVELOPMENT.)	6/20/78		—	—
F	14A 14A 4A 11B	ADDED 1" GLAND SEALING STEAM LINE TO BALL PMP & CARGO PMP TURBINES (WORK ACCOM. ON 613C) GER	10/9/78		—	—
G	22-A 22-C	ADDED SOOT BLOWER STEAM TO BOILER UPTAKE VALVE. WORK ACCOMPLISHED ON 613C	11/14/78		—	—
H	-	ADDED WELD INDEX NUMBERS FOR 614C ONLY. ADDED NOTE #17 + REF. #19	1/5/79		—	—

~~AUTHORITY:~~

GENERAL NOTES:

1. THIS PLAN DEVELOPED IN ACCORDANCE WITH REF. # 1 & 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD & THE AMERICAN BUREAU OF SHIPPING. SEE REF # 2 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S. COAST GUARD, THE A.B.S., & REF. # 3.
4. ALL BUTT WELDS ARE P-3 & SOCKET WELDS ARE P-14A IN ACCORDANCE WITH REF. # 3. (B)
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS, & HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMPS, ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATED AS SHOWN.
7. PAINTING IS TO BE ACCORDANCE WITH REF. # 8.
8. TEST ARE TO BE IN ACCORDANCE WITH REF. # 2.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REF. # 5.
10. PIPE HANGERS ARE TO BE AS DETAILED ON REF # 17, UNLESS OTHERWISE NOTED.
11. ALL PIPING ON THIS ARRANGEMENT IS CLASS I.
12. BACKING RINGS & COUPLINGS SHOWN IN MATERIAL LIST ARE TO BE USED AS REQUIRED.
13. SPRING HANGERS (SH-1, FOR EXAMPLE) AND TIE RODS (TR-1, FOR EXAMPLE) INDICATED ON REF # 17 ARE TO BE INSTALLED WITHIN 6" OF POSITION SHOWN.
14. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
15. ALL HOLES THRU BHD & DECKS ARE CUT FROM STRUCTURAL DWGS.
16. DIMENSIONS GIVEN ON THIS PLAN ARE FOR REFERENCE AND MAY BE ALTERED TO SUIT INSTALLATION.
17. WELD JOINTS MARKED THUS [614-] ARE TO BE RADIOGRAPHED FOR HG14C ONLY IN ACCORDANCE WITH REF. # 19.

FOR LIST OF MATERIAL, SEE 6450-741

NO.	REFERENCES	DWG NO.
19	WELD INDEX TABULATION FOR MISC PP SYS (614C ONLY)	283301
18	ARR INERT GAS SUPPLY FROM UPTAKES TO SCRUBBER	2730-382
17	PIPE HANGERS - RED. PRESS STM FOR ARR DWG 6450-740	6450-763
16	PP ARR MISC INSTRUMENTS IN E.R	6755-67
15	ST. & EXH ARR CARGO PUMP ROOM	6450-679
14	PIPING ARR TURB DRAINS	6555-567
13	PIPING ARR H.P. ST DRAIN SYS - ER	6555-475
12	SLEEVES & BOSSES FOR PP SYS MERCHANT STD	216522
11	PIPING ARR LP ST DRAIN SYS - ER	6555-466
10	PIPING ARR BOILER PRESS AUX ST - ER	6450-737
9	PIPING ARR RELIEF VLV ESCAPE SYS - ER	6451-494
8	PAINTING SCHEDULE	8300-40
7	LIST OF THERMOMETERS FURN BY SHIPYARD	6750-482
6	LIST OF PRESS & VAC GAGES FURN BY SHIPYARD	6750-483
5	TYPICAL ARR OF GAGE PIPING	6750-481
4	DIRECTIONS FOR INSULATIONS & LAGGING PIPING	257322
3	FABRICATION & WELDING INSTRUCTIONS - CL I & II PP	257085
2	DIAGRAM AUX STEAM SYS - L/M	6450-684
1	DIAGRAM AUX STEAM SYS - ARR	6450-683

N N S & D D CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C 613C	310 309	

APPROVALS		
OWNERS	ABS	NOT REQ'D
	USCG	NOT REQ'D

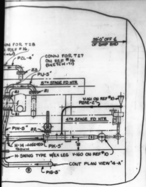
Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689

SCALE ½" OR AS NOTED = 1 FT
DRAWN E.R. SMOOT
CHECKED H.M. EDGE
SECT MGR J.H. Johnson
TECH APPROVAL 4/16/76
DATE COMPL. 5-13-76
EXAMINED —
AUTHORIZED E.F. Stephenson
DATE 5-14-76
C S D APPROVAL E.E.S. for R.L. HARRINGTON

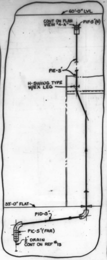
PIPING ARR REDUCED PRESSURE STEAM - PLAN, SECT & ELEV

U S M A DESIGN T11-S-116a
U S M A DWG NO. —
HULL NO. —
DWG NO. 6450-740
REV H
SHEET NO. 1 OF 1

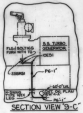
6450.740
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 1


CONN FOR T28 ON REF #16
CONN FOR T27 ON REF #16 (SKETCH-11)
P2L-4"
P1J-5"
5TH STAGE FD HTR
4TH STAGE FD HTR
V-161 ON REF #10
P12AE-2"
P1H-5"
P1K-5"
H-14 INVERTED
H-SWING TYPE W/EX LEG - V-160 ON REF #10
CONT PLAN VIEW "4-A"
P1G-5"
33'-0" OFF ℄ OF SHIP BHD

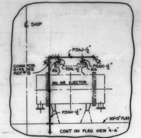
TION VIEW "10-C"


60'-0" LVL
CONT ON PLAN VIEW "4-A"
P1F-5"
P1E-5"
H-SWING TYPE W/EX LEG
33'-0" FLAT
P1D-5"
P1C-5" (FAR)
½" DRAIN CONT ON REF #13

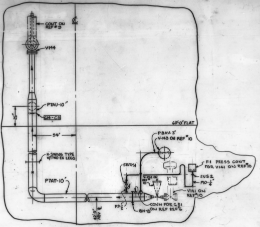
SECT VIEW "10-B"


S.S. TURBO GENERATOR
FLG & BOLTING FURN WITH TG
10ES1
25BRS1
P6-1"
H-SWING TYPE W/EX
60'-0" LVL
CONT ON PLAN VIEW 4-A
P6-1"

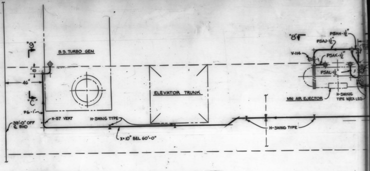
SECTION VIEW "9-C"

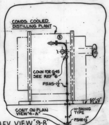

℄ SHIP
P5AJ-1½
CONN FOR G-43 SEE REF #5
P5AL-1½
P5AK-1½"
MN AIR EJECTOR
P5AH-1½"
33'-0" FLAT
CONT ON PLAN VIEW "4-A"

SECT VIEW "8-C"

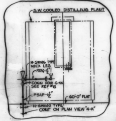

℄
CONT ON REF #5
V144
P7AU-10"
G14-C5
54"
60'-0" FLAT
P5AV-3"
V-143 ON REF #10
H-SWING TYPE W/TWO EX LEGS
F-1 PRESS CONT FOR V141 ON REF 10
5BRS1
2US2
P10-½"
P7AT-10"
V141 ON REF 10
P9-½"
6H-8 ON REF #6
CONN FOR GB1 ON REF 6

SECT VIEW "7-C"

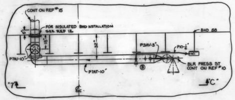

"9"
"C"
S.S. TURBO GEN
46"
ELEVATOR TRUNK
P6-1"
H-57 VERT
H-SWING TYPE
33'-0" OFF ℄ BHD
X=10" BEL 60'-0"
H-SWING TYPE
"8"
P5AH-1½"
P5AJ-1½
V-114
P5AK-1½"
P5AL-1½
MN AIR EJECTOR
H-SWING TYPE W/EX LEG


CONDS COOLED DISTILLING PLANT
CONN FOR G45 SEE REF #6
P5AS-1½
60'-0" FLAT
CONT ON PLAN VIEW "4-A"
H-SWING TYPE
P5AR-1½

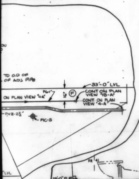
ELEV VIEW "9-B"


S.W. COOLED DISTILLING PLANT
H-SWING TYPE W/EX LEG
P5AQ-1½
CONN FOR G-44 SEE REF #6
P5AP-1½
H-SWING TYPE
60'-0" FLAT
CONT ON PLAN VIEW "4-A"

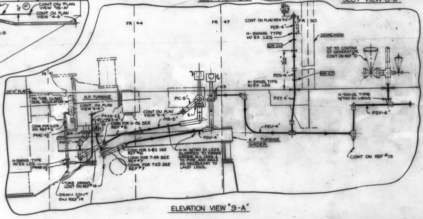
SECT VIEW "8-B"


CONT ON REF #15
FOR INSULATED BHD INSTALLATION SEE REF 12
BHD 58
P3AV-3"
P10-½"
P7AU-10"
P7AT-10"
BLR PRESS ST CONT ON REF #10
"7"
"C"
℄

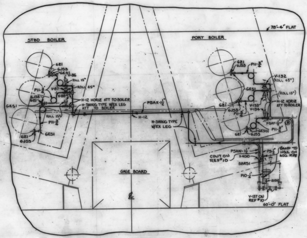
PLAN VIEW "6-B"


TO O.D OF OF ADJ PIPE
33'-0" LVL
P6-1"
CONT ON PLAN VIEW "10-A"
ON PLAN VIEW "4-A"
CONT ON PLAN VIEW "4-A"
P4Z-2½"
P1C-5
LVL

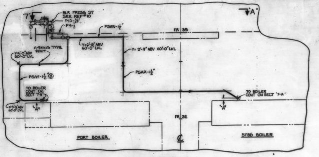
1-B


FR 44
FR 47
FR 50
CONT ON PLAN VIEW "4-A"
P2R-4"
H-SWING TYPE W/ EX LEG
STANCHION
G14-CU
ST TO CONTAM ST GENERATOR CONT ON REF 10
G14-CT
P2S-4"
H-SWING TYPE W/ EX LEG
H-SWING TYPE W/TWO EX LEGS
P2T-4"
P2V-4"
FR 41
33'-0" FLAT
MN TURB GLAND SEAL REGULATOR
H.P. TURBINE
CONT ON PLAN VIEW "4-A"
P1C-5"
CONT ON PLAN VIEW "4-A"
P4AA-2½
CONN FOR G-56 SEE REF #6
P1B-5"
P2U-4"
CONN FOR G-278 ON REF #6
P4AC-2½
P1A-5"
H.P. TURBINE GIRDER
CONT ON REF #13
CONN FOR G-65 SEE REF #6
CONN FOR T-26 SEE REF #7
CONN FOR T-25 SEE REF #7
H-14 W/TWO EX LEGS SLOPPED TO TURBINE GIRDER ALL LEGS ⊥ TO PIPE ADD ANGLE AS NECESSARY TO LAND LEGS.
H-SWING TYPE W/EX LEG
P4AB-2½
TURB DRAINS CONT ON REF #14
DRAIN CONT ON REF #14

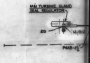
ELEVATION VIEW "9-A"


78'-4" FLAT
STBD BOILER
PORT BOILER
G21
6JS3
GES1
P11-½"
V-87
V-88
ROLL 15°
ROLL 45°
H-12 HORIZ ATT TO BOILER
H-SWING TYPE W/EX LEG ATT TO BOILER
P5AK-1½
H-12
H-SWING TYPE W/EX LEG
V-132 ROLL 45°
ROLL 15°
H-12 HORIZ ATT TO BOILER
V-133
V-134
P5AV-1½
P5AW-1½"
V-4010
CONT ON REF #10
5BRS1
P10-½"
BAND TO INSUL ON ADJ PIPE
V-137 ON REF #10
60'-0" FLAT
GAGE BOARD
℄

SECT VIEW "7-A"


"7"
"A"
BLR PRESS ST SEE REF #10
P10-½"
P9-½
P5AW-1½
FR 35
Y=6'-9" ABV 60'-0" LVL
H-SWING TYPE VERT
Y=5'-11" ABV 60'-0" LVL
P5AX-1½
P5AY-1½
TO BOILER CONT ON SECT "7-A"
TO BOILER CONT ON SECT "7-A"
FR 32
PORT BOILER
STBD BOILER
℄

PLAN VIEW "6-A"


MN TURBINE GLAND SEAL REGULATOR
25
P4AB-2½

MICRO-MASTER® 105 mm

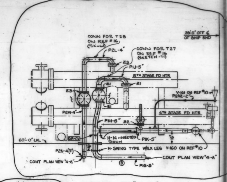
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

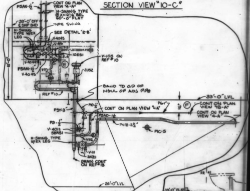
6450.740

FRAME 2



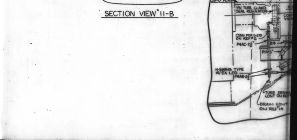
CONN FOR T28 ON REF #16 (SK-61)
CONN FOR T27 ON REF #16 (SKETCH-71)
P2L-4"
P1J-5"
5TH STAGE FD HTR
4TH STAGE FD HTR
V-161 ON REF #10
P2AE-2"
P2M-4"
P1H-5"
H-14 INVERTED DOWN
P1K-5"
60'-0" LVL
P2N-4(F)
H-SWING TYPE W/EX LEG
V-160 ON REF #10
CONT PLAN VIEW "4-A"
P1G-5"
39'-0" OFF ℄ OF SHIP BHD

SECTION VIEW "10-C"

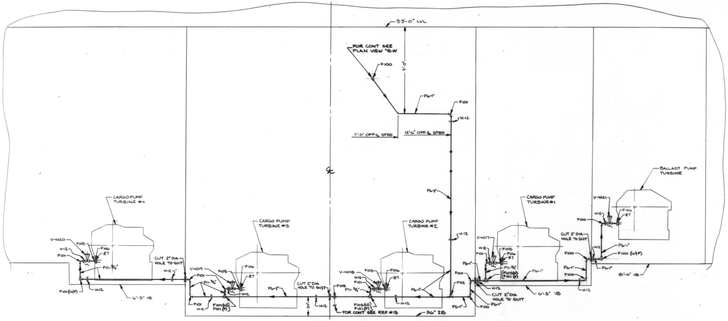


P5AN-1½"
CONT ON PLAN VIEW "4-A"
H-SWING TYPE @ X=12'-6" BEL 60'-0" FLAT
39'-0" OFF ℄ SHIP BHD
TYPE SWING
H-SWING TYPE W/EX LEG
SEE DETAIL "2-B"
V-4045
V-105 ON REF #10
P5AM-1½
V-4043
10'-0"
BAND TO O.D OF INSUL OF ADJ PIPE
REF #10
33'-0" LVL
CONT ON PLAN VIEW "4-A"
CONT ON PLAN VIEW "18-A"
P5K-3"
P5AD-1½
P4B-2½"
P1C-5
F3-½"
V-4011
H-SWING TYPE W/EX LEG
DRAIN CONT ON REF #18
24'-0" LVL

SECTION VIEW "11-B"



FR 41
33'-0" FLAT
HW TURB GLAND SEAL REGULATOR
CONN FOR G-273 ON REF #6
P4AC-2½
H-SWING TYPE W/EX LEG
P4AB-2½
TURB DRAIN CONT ON REF
DRAIN CONT ON REF 14



33'-0" LVL
FOR CONT SEE PLAN VIEW "18-A"
F100
9'-0"
P6-1"
7'-0" OFF ℄ STBD
12'-6" OFF ℄ STBD
H-12
℄
BALLAST PUMP TURBINE
CARGO PUMP TURBINE #4
CARGO PUMP TURBINE #3
CARGO PUMP TURBINE #2
CARGO PUMP TURBINE #1
V-4020
V-4019
V-4018
V-4017
V-4021
F105
F106
27
F101
P11-¾"
CUT 2" DIA HOLE TO SUIT
F101 (N/F)
6'-3" IB
F104 (N)
F101 (F)
FOR CONT SEE REF #13
F108
F103 (N)
36" IB
F102
8'-6" IB
F100 (N/F)

SECTION "14-A" Ⓕ

FR 54 LKG FWD

6450.740

MICRO-MASTER 105 mm

K+E

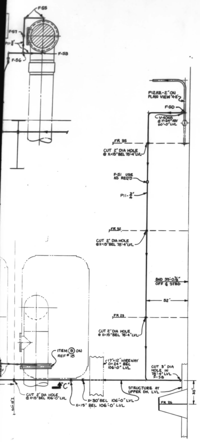
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

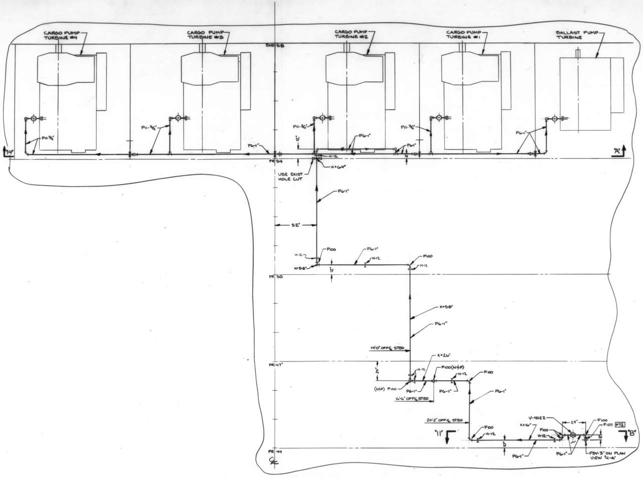
SEPT. '80

FRAME 3

10X

21 | 20 | 19 | 18 | 17 | 16


F-55
F-57
P11-3/4"
F-53
F-56
P12A2-2" ON PLAN VIEW "4-A"
F-50
V-4048 @ Y=64" ABV 60'-0" LVL
FR 35
CUT 2" DIA HOLE @ X=15" BEL 78'-4" LVL
F-51 USE AS REQ'D
P11-3/4"
FR 32
CUT 2" DIA HOLE @ X=15" BEL 78'-4" LVL
BHD 33'-0 7/8" OFF ℄ STBD
52"
FR 29
CUT 2" DIA HOLE @ X=15" BEL 78'-4" LVL
ITEM ⑨ ON REF # 18
17"×12" WIREWAY D=24" BEL 106'-0" LVL
CUT 3" DIA HOLE IN 78'-4" LVL F-58
"C"
STRUCTURE AT UPPER DK LVL
30"
FR 26
CUT 2" DIA HOLE @ X=15" BEL 106'-0" LVL
X=30" BEL 106'-0" LVL
X=15" BEL 106'-0" LVL


CARGO PUMP TURBINE #4
CARGO PUMP TURBINE #3
CARGO PUMP TURBINE #2
CARGO PUMP TURBINE #1
BALLAST PUMP TURBINE
BHD 58
P11-3/4"
P11-3/4"
P11-3/4"
P11-3/4"
P6-1"
P6-1"
P6-1"
P6-1"
12"
"14"
"A"
FR 54
H-12
X=64"
USE EXIST HOLE CUT
P6-1"
52"
H-12
F100
P6-1"
H-12
F100
H-12
X=58"
12"
FR 50
X=58"
P6-1"
14'-0" OFF ℄ STBD
X=26"
FR 47
24"
H-12
F100(N&F)
H-12
F100
(N&F) F100
P6-1"
P6-1"
P6-1"
16'-6" OFF ℄ STBD
20'-2" OFF ℄ STBD
F100
H-12
"11"
X=16"
V-4022
F100
H-12
29"
F100
F107
P72
"B"
10"
P6-1"
P6-1"
P3V-3" ON PLAN VIEW "4-A"
FR 44
℄

PLAN VIEW "18-A" Ⓕ
"X" DIMENSION BELOW 33'-0" LVL

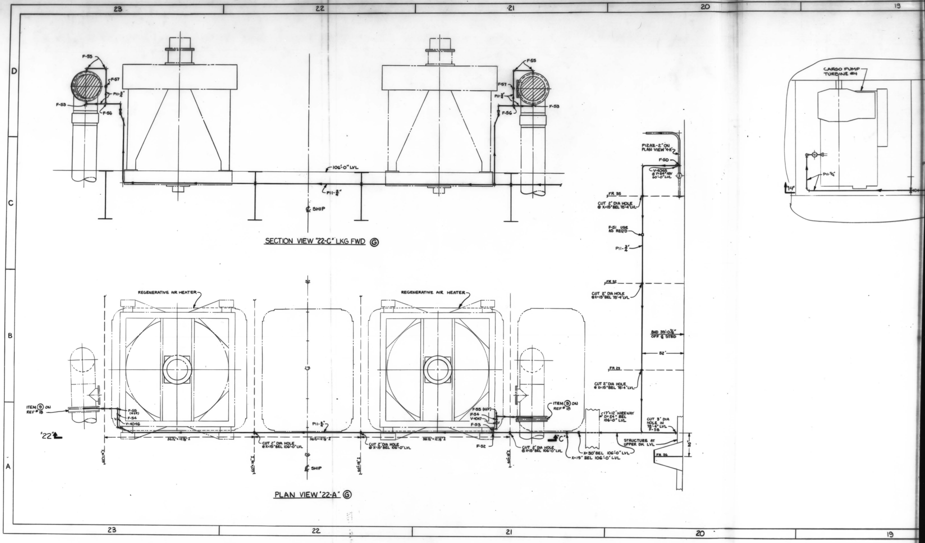
V-4020
F100
H-12
F101
F101(N&F)

21 | 20 | 19 | 18 | 17 | 16

6450.740

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 4
10X


23
22
21
20
19
D
C
B
A
F-55
F-57
P11-3/4"
F-53
F-56
106'-0" LVL
P11-3/4"
℄ SHIP
SECTION VIEW "22-C" LKG FWD Ⓖ
CARGO PUMP TURBINE #4
P11-3/4"
14"
P12A2-2" ON PLAN VIEW '4-A'
F-50
V-4048 @ Y=64" ABV 60'-0" LVL
FR 35
CUT 2" DIA HOLE @ X=15" BEL 78'-4" LVL
F-51 USE AS REQ'D
P11-3/4"
FR 32
CUT 2" DIA HOLE @ X=15" BEL 78'-4" LVL
BHD 39'-0 7/8" OFF ℄ STBD
52"
FR 29
CUT 2" DIA HOLE @ X=15" BEL 78'-4" LVL
REGENERATIVE AIR HEATER
REGENERATIVE AIR HEATER
32
29
26
ITEM ⑨ ON REF # 18
F-55 (N/F)
F-54
V-4046
"22"
36 1/2" x 12 1/8" I
CUT 2" DIA HOLE @ X=15" BEL 106'-0" LVL
60" x 18" I
P11-3/4"
℄ SHIP
F-55 (N/F)
F-54
V-4047
F-53
F-52
ITEM ⑨ ON REF # 18
"C"
CUT 2" DIA HOLE @ X=15" BEL 106'-0" LVL
17" x 12" WIREWAY D=24" BEL 106'-0" LVL
X=30" BEL 106'-0" LVL
X=15" BEL 106'-0" LVL
CUT 3" DIA HOLE IN 78'-4" LVL F-58
STRUCTURE AT UPPER DK LVL
FR 26
30"
PLAN VIEW "22-A" Ⓖ

6450.740

MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 5

6450-741

CSD Vault X163

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS PARTIAL ISSUE
GROUPING YES
DATE 11-21-8
SIGNED J. K. Johnson

YARD PRINTS | ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS																					
REV.	G	G	D	F	A	F	B	B	B	A	E	F	C	E	F	A	F	C	F	G
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	12A	17	12B	15A

GROUP
MC NO.

PARTIAL ISSUE

NNS&DDCo HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C 613C	310 309	T11-S-116a	

DWG. REV. — HULL APPLIC.

REV.	613C	614C
A	YES	YES
B	YES	YES
C	Yes	Yes
D	YES	YES
E	YES	YES
F	YES	YES
G	YES	YES

APPROVALS
OWNERS
ABS NOT REQ'D
USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division FSCM NO. 43689
COMMERCIAL SHIP DESIGN DEPT.

FOR ARR SEE NN DWG 6450-740
FOR PIPE DETAILS SEE NN DWG 6450-742
INSTALLATION GROUPS: 6450-0113-1009 PI, 6450-0115-1010 PI, 6450-0105-1011 PI, 6450-0104-1012 PI 6450-0105-1013 SI, 6450-0113-1014 SI, 6450-0110-1005 PI

SCALE NONE =1 Ft.
DRAWN E.R.SMOOT
CHECKED H.M.EDGE
SECT. MGR. J. H. Johnson
DATE COMPL. 5-14-76
EXAMINED
AUTHORIZED E E Stephenson
DATE 5-14-76
TECH. APPROVAL — NR
CSD APPROVAL EEK for R.L. HARRINGTON

GROUPED | BY | CHK. | DATES | COMP. | PART | HULL 613C, 614C | GROUP NO. | KEY

TYPE OF DWG. —

TITLE
PIPING ARR REDUCED PRESSURE STEAM - LIST OF MATERIAL

DWG. NO. 6450-741 REV G SHEET NO. 1 OF 17

REVISIONS			NNS & DDCo. DATE	AUTH'D	OWNER DATE	APPD.
REV.	**SHEET**	**DESCRIPTION**				
A	—	INTIAL ISSUE RJP				
B	8 3 9 10	CORRECTED INSTALLATION GROUP NO. ADDED P2N & P2P (LN 7 & 7A) ADDED P2X (LN 5A) VALVE NO. ALTD TO AGREE WITH DIAG WAS V-108 (R.H.)				
	4	ADDED LINE #6 AND LINES 10-18.				
	6	ADDED LINES 8, 11, 12, 13 & 14				
	7	ADDED LINES 12-14				
	8	ADDED LINE #10 AND LINES 12-19.				
	12A	ADDED SHT 12-A.				
	14,15	SHT 14: ADDED L#16. SHT 15: ADDED LINES 6-12. WDG	6/6/7	AC		
C	13 17.	DELETED LINES 7 & 8. ADDED SHT NO. 17. WDG	2/6/8	AC		
D	3 4	DELETED LINE 9, 10, 16 DELETED LINE 4, 5, 13.	5/10/8	AC		
E	11 12A 14	ADDED LINES 12 THRU 16. QTY LINE NO. 7 WAS 8 S/M FOR LINE NO. 8 WAS 6450-M13 ④ WDG	4/20/8	AC		
F	4 6 12A 15	ADDED HGR LOADS & VERT MOVE TO L'S 14-16 12 & 13 14 & 15 12 WDG				
	12	ALT'D GASKET MAT'L, WAS ASBESTOS. (WORK ACCOM ON 613C.) LINES 3, 6, 9, 15, & 18				
	12B 12	ADDED SHEET ADDED LINES 19, 20, 21 } WORK ACCOM ON 613C GER	11/14/8	AC		
G	15A	ADDED SHEET, WORK ACCOM ON 613C	11/11/8		—	—

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF. 1.

NO.	REFERENCES	DWG. NO.
1	DIAGRAM DESUPHTD AUX ST & HP TURB BLEED - LIST	6450-684

HULL NO. 613C, 614C
DWG. NO. 6450-741
REV. G SHEET 2 OF —

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1F	5" IPS × STD THK PIPE STL	PMO 6450-742	PS	
		2	1	P1G	↓	↓	↓	
		3	1	P1H	↓	↓	↓	
		4	1	P1J	↓	↓	↓	
		5	1	P1K	↓	↓	↓	
B		6	1	P2L	4" IPS	↓	↓	
B		6A	1	P2M		↓	↓	
B		7	1	P2N	↓	↓	↓	
B		7A	1	P2P	↓	↓	↓	
		8	1	P12AZ	2" IPS	↓	↓	
D		9	~~24'~~	~~P9~~	~~1/2" IPS × X" HVY THK PIPE STL~~	~~K67-07-102~~		
D		10	~~6'6"~~	~~P10~~	~~1/4" IPS~~	~~K57-07-100~~		
		11						
		12		VALVE NO.				
		13	1	V-81	2½" × 4" ANGLE RELIEF 300# × 150# FLG'D STL (SET @ 280/7316)	PO ⑥ 6450-C7	MD-PS	
		14	1	V-169	4" GLOBE STOP FLG'D 300# C'STL *	PO ⑤ 6950-M5	↓	
		15	1	V-175	5" GLOBE STOP FLG'D 300# C'STL	↓ ⑧	↓	
D		16	~~1~~	~~V-4012~~	~~1/2" GLOBE STOP SW 800# C'STL~~	~~S/ 26-09-275~~	~~ST-PS~~	
		17						
		18						

REMARKS -
* TO BE PROVIDED WITH EXTENSION STEM ORDERED ON DWG. 257335

SERVICE - REDUCED PRESS ST
GROUP NO. PS-152 6450-0113-1009 PI SHT 1 OF 3
APPLICABLE HULLS 613C 614C
DWG NO. 6450-741 SHEET 3 REV. D

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	3	50WS1	5" BACKING RING STL (STD)	97-18-133	ST-PS	
		2	2	40WS1	4" ↓	97-18-131	↓	
		3	1	30WS1	3" ↓	97-18-126	↓	
D		4	~~1~~	~~2US2~~	~~1/4" UNION SCR'D 3000# STL~~	~~PO ㊸ 6200-M12~~	~~MD-PS~~	
D		5	~~1~~	~~5BRS1~~	~~1/2" × 1/4" INSERT RED 3000# STL SW~~	~~㊹~~		
B		6	6'-6"	F-2	3" × 3" × 3/8 STL ANGLE	MO 257726 S.3 L.14	ST-PS	
		7						
		8						
		9		HANGER NO.				
B		10	1	H-57	5" SWING TYPE HGR	MO 257726 S.21 L.1	ST-PS	
B		11	1	H-11	5" SWING TYPE HGR W/EX LEG	25-46-426	↓	
B		12	1	H-14	5" SWING TYPE HGR	25-49-426	↓	
D		13	~~1~~	~~H-3~~	~~1/4 FIXED TYPE HGR~~	~~25-42-304~~		
F		14	1	SH-1	SIZE 4" · HOT LOAD 193/193 · VERT MOVE COLD-HOT .66 DN	PO (55) 6552-C16	MD-PS	
F		15	1	SH-2	4" · 121/121 · .37 DN	(56) ↓	↓	
F		16	1	SH-5	5" · 128/128 · 1.25 UP	(59) ↓	↓	
B		17	1	TR-1	5" TIE ROD ASSY	MO 257726 S.22 L.8	ST-PS	
B		18	1	TR-2	4" TIE ROD ASSY	MO 257726 S.22 L.14	↓	

REMARKS -

SERVICE - REDUCED PRESS ST
GROUP NO. PS-152 6450-0113-1009 PI SHT 2 OF 3
APPLICABLE HULLS 613C 614C
DWG NO. 6450-741 SHEET 4 REV. F

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	24	Z1	5"	STUDS	STUD 3/4" ALLOY STL L=4¾"	21-18-570	ST-PS	
	2	48			NUTS	3/4" HVY HEX STL	6000-C11 ③	MD-PS	
	3	3			GSKT	1/16" THK COMPR ASB 300#	15-01-250E	ST-PS	
	4	8	Z2	2½"	STUDS	STUD 3/4" ALLOY STL L=4"	21-18-564	↓	
	5	16			NUTS	3/4" HVY HEX STL	6000-C11 ③	MD-PS	
	6	1			GSKT	1/16" THK COMPR ASB 300#	15-01-242E	ST-PS	
	7	24	Z3	4"	STUDS	STUD 3/4" ALLOY STL L=4½"	21-18-568	↓	
	8	48			NUTS	3/4" HVY HEX STL	6000-C11 ③	MD-PS	
	9	3			GSKT	1/16" THK COMPR ASB 300#	15-01-248E	ST-PS	
	10		○		BOLTS				
	11				NUTS				
	12				GSKT				
	13		○		BOLTS				
	14				NUTS				
	15				GSKT				
	16		○		BOLTS				
	17				NUTS				
	18				GSKT				
	19		○		BOLTS				
	20				NUTS				
	21				GSKT				
	22		○		BOLTS				
	23				NUTS				
	24				GSKT				
	25		○		BOLTS				
	26				NUTS				
	27				GSKT				
	28		○		BOLTS				
	29				NUTS				
	30				GSKT				
	31		○		BOLTS				
	32				NUTS				
	33				GSKT				
	34		○		BOLTS				
	35				NUTS				
	36				GSKT				
	37		○		BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - REDUCED PRESS ST
GROUP NO. PS-152 6450-0113-1009 PI SHT 3 OF 3
APPLICABLE HULLS 613C 614C
DWG NO. 6450-741 SHEET 5 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2Q	4" IPS × STD THK PIPE STL	PMO 6450-742	PS	
		2	1	P2R	↓	↓	↓	
		3						
		4						
		5						
		6		FITTING NO.				
		7	2	40WS1	4" BACKING RING STL (STD)	97-18-131	ST-PS	
B		8	4	F-3	ANCHOR LUGS (3" × 1/2" F.B L= 3¾")	S/ 71-30-515	PS	
		9						
		10		HANGER No				
B		11	1	H-11	4" SWING TYPE HANGER W/EX LEG	25-46-416	ST-PS	
F		12	1	SH-3	SIZE 4" · HOT LOAD 227 · VERT MOVE COLD-HOT .91" UP	PO (57) 6552-C16	MD-PS	
F		13	1	SH-4	4" · 326 · 1.48" UP	(58) ↓	↓	
B		14	1	TR-3	4" TIE ROD	MO 257726 S.23 L.3	ST-PS	
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - REDUCED PRESS ST
GROUP NO. PS-152 6450-0115-1010 PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C
DWG NO. 6450-741 SHEET 6 REV. F

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1C	5" IPS × STD THK PIPE STL	PMO 6450-742	PS	
		2	1	P1D	↓	↓	↓	
		3						
		4						
		5						
		6						
		7						
		8		FITTING NO.				
		9	1	50WS1	5" BACKING RING STD STL	97-18-133	ST-PS	
		10						
		11		HANGER No				
B		12	1	H-11	5" SWING TYPE HGR W/EX LEG	25-46-426	ST-PS	
B		13	1	RH-2	5" ROD HANGER	MO 257726 S.23 L.6	↓	
B		14	1	RH-3	5" ROD HANGER	MO 257726 S.23 L.12	↓	
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - REDUCED PRESS ST
GROUP NO. PS-152 6450-0105-1011 PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C
DWG NO. 6450-741 SHEET 7 REV. B

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2T	4" IPS × STD THK PIPE STL	PMO 6450-742	PS	
		2	1	P2U	↓	↓	↓	
		3	1	P2V	↓	↓	↓	
		4						
		5						
		6						
		7						
		8		FITTING NO.				
		9	3	40WS1	4" BACKING RING STL (STD)	97-18-131	ST-PS	
B		10	11'-0"	F-2	3" × 3" × 3/8" STL ANGLE	MO 257726 S.3 L.14	↓	
		11		HANGER No				
B		12	1	H-14	4" SWING TYPE HANGER W/ TWO EX LEGS	S/ 25-49-416	ST-PS	
B		13	1	H-11	4" SWING TYPE HANGER W/EX LEG	25-46-416	↓	
B		14	1	RH-4	4" ROD HANGER	MO 257726 S.24 L.1	↓	
B		15	1	RH-5	↓	MO 257726 S.24 L.7	↓	
B		16	1	RH-6	↓	MO 257726 S.24 L.9	↓	
B		17	1	TR-5	TIE ROD	MO 257726 S.24 L.12	↓	
B		18	1	H-13	1/2 SWING TYPE HGR	S/ 25-48-366	↓	
B		19	3	H-15A	FIXED HGR FOR 1/2" & 1/4" IPS	S/ 25-49-802	↓	

REMARKS -

SERVICE - REDUCED PRESS ST
GROUP NO. PS-150 6450-0104-1012 PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C
DWG NO. 6450-741 SHEET 8 REV. B

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1A	5" IPS × STD THK PIPE STL	PMO 6450-742	PS	
		2	1	P1B	↓	↓	↓	
		3	1	P1E	↓	↓	↓	
		4	1	P2S	4" IPS	↓	↓	
B		5	1	P2W	↓	↓	↓	
B		5A	1	P2X	↓	↓	↓	
		6	1	P3Y	3" IPS	↓	↓	
		7	1	P4Z	2½" IPS	↓	↓	
		8	1	P4AA	↓	↓	↓	
		9	1	P4AB	↓	↓	↓	
		10	1	P4AC	↓	↓	↓	
		11	1	P5AD	1½" IPS	↓	↓	
		12				↓	↓	
		13	1	P5AF	1½" IPS	↓	↓	
		14	1	P5AG	↓	↓	↓	
		15	1	P5AH	↓	↓	↓	
		16	1	P5AJ	↓	↓	↓	
		17	1	P5AK	↓	↓	↓	
		18	1	P5AL	↓	↓	↓	

REMARKS -

SERVICE - REDUCED PRESS ST
GROUP NO. PS-163 6450-0105-1013 SI SHT 1 OF 6
APPLICABLE HULLS 613C 614C
DWG NO. 6450-741 SHEET 9 REV. B

6450-741

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

6450-741

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

NN 3569

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P5AM	1½" IPS × STD THK PIPE STL	PMO 6450-742	PS	
	2	1	P5AN				
	3	1	P5AP				
	4	1	P5AR				
	5	120'-0"	P6	1" IPS	K57.06-104		
	6	12"	P9	½" IPS×"X" HVY THK PIPE STL	K57-07-102		
	7	10'-0"	P10	¼" IPS	K57.07.100		
	8						
	9		VALVE NO.				
	10	1	V-89	1" GLOBE STOP 600# SW C.STL	PO ⑧ 6450-C9	MD-PS	
B	11	1	V-112	1½"	ON PIPE DET 6450-742	ST-PS	
	12	1	V-111	2½" FLG'D	PO ⑳ 6450-C4	MD-PS	
	13	1	V-113	1½" S.W.	ON PIPE DET 6450-742	ST-PS	
	14	1	V-114	1½"			
	15	1	V-115	1½"			
	16	1	V-168	4" ANGLE STOP CHK FLG'D 300# C-STL MOTOR OPER	PO ④ 6950-MS	MD-PS	
	17	1	V174	5"	⑦		
	18	1	V4011	½" GLOBE STOP 600# SW C-STL	S/ 26-09-275	ST-PS	

REMARKS –

SERVICE – REDUCED PRESS ST

PS-163

GROUP NO. 6450-0105-1013 SI SHT 2 OF 6

APPLICABLE HULLS 613C 614C

DWG NO. 6450-741 SHEET 10 REV. B

NN 3569

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	FITTING NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	2US2	¼" UNION SCR'D 3000# STL	PO ㊸ 6200-M12	MD-PS	
	2	1	5BRS1	½"×¼" INSERT RED 3000# SW STL	㊶		
	3	4	14CS1	1½" COUPLING 3000# SW STL	⑳		
	4	5	10CS1	1" COUPLING 3000# SW STL	⑱		
	5	3	50WS1	5" BACKING RING STL (STD)	97-18-133	ST-PS	
	6	2	40WS1	4"	97-18-131		
	7	1	30WS1	3"	97-18-126		
	8						
	9		FLANGE NO.				
	10	1	12JS12	1¼" FLANGE 600# SW STL	PO ㉘ 6450-C34	MD-PS	
	11						
E	12	2	F-4	1" TEE S.W 3000# STL	2560-079	ST-PS	
E	13	2	F-5	1" ELL 90° S.W 3000# STL	25-60-008		
E	14	1	V-4043	1" SOLENOID VALVE S.W 600# STL	PO ① 6450-C65		
E	15	1	V-4044	1" GLOBE STOP VLV S.W. 600# STL	26-09-277		
E	16	1	V-4045				
	17						
	18						

REMARKS –

SERVICE – REDUCED PRESS ST

PS-163

GROUP NO. 6450-0105-1013 SI SHT 3 OF 6

APPLICABLE HULLS 613C 614C

DWG NO. 6450-741 SHEET 11 REV. E

NN 3569

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	24	Z1	5"	BOLT	STUD ¾" ALLOY STL L=4¾"	21-18-570	ST-PS	
	2	48			NUTS	¾" HVY HEX STL	6000-C11 ③	MD-PS	
F	3	4			GSKT	FLEXITALLIC GASKET 300#	PO 6450 ④ C66	MD-PS	
	4	16	Z3	4"	BOLT	STUD ¾" ALLOY STL L=4½"	21-18-568	ST	
	5	32			NUTS	¾" HVY HEX STL	6000-C11 ③	MD-PS	
F	6	2			GSKT	FLEXITALLIC GAS. 300#	PO 6450-C66 ④	MDPS	
	7	12	Z4	6"	BOLT	STUD ¾" ALLOY STL L=5"	21-18-572	ST	
	8	24			NUTS	¾" HVY HEX STL	6000-C11 ③	MD-PS	
F	9	1			GSKT	FLEXITALLIC GASKET 300#	PO 6450-C66 ④	MDPS	
	10	8	24Z1	2½"	BOLTS	⅝" HVY HEX HD STL L=2¾"	6000-C7 ㉖	MD-PS	
	11	8			NUTS	⅝" HVY HEX STL	6000-C11 ②		
	12	2			GSKT	1/16" THK COMPR ASB 150#	15-01-272 B	ST-PS	
	13	4	Z5	1¼"	BOLTS	⅝" HVY HEX HD STL L=2⅝	6000-C7 ⑥	MD-PS	
	14	4			NUTS	⅝" HVY HEX STL	6000-C11 ②		
F	15	1			GSKT	FLEXITALLIC 600#	15-04-104	ST-PS	
	16	8	Z6	1½"	BOLTS	¾" HVY HEX HD STL L=2⅝	6000-C7 (56)	MD-PS	
	17	8			NUTS	¾" HVY HEX STL	6000-C11 ③		
F	18	2			GSKT	FLEXITALLIC 600#	15-04-106	ST-PS	
F	19	20	㉗	1"	BOLTS	⅝" HVY HEX HD STL L=2½"	6000-C7 ㉗		
F	20	20			NUTS	⅝" HVY HEX	6000-C12 ⑮		
F	21	5			GSKT	FLEXITALLIC 600#	15-04-102		
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

REMARKS –

SERVICE – REDUCED PRESS ST

PS-163

GROUP NO. 6450-0105-1013 SI SHT 4 OF 6

APPLICABLE HULLS 613C 614C

DWG NO. 6450-741 SHEET 12 REV. F

NN 3569

GROUP

REV.	LINE NO.	QTY (1 SHIP)	HANGER Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	H-14	5" SWING TYPE HGR	25-49-426	ST-PS	
B	2	1	H-14	4" SWING TYPE HGR	25-49-416		
B	3	3	H-11	2½" SWING TYPE HGR W/EX LEG	25-46-386		
B	4	1	H-57	2½" SWING TYPE HGR	MO 257726 S.21 L.8		
B	5	6	H-11	1½" SWING TYPE HGR W/EX LEG	25-46-366		
B	6	8	H-11	1½" SWING TYPE HGR	25-46-366		
E	7	9	H-11	1" SWING TYPE HGR	25-46-346		
B	8	3	H-11	1" SWING TYPE HGR W/EX LEG	25-46-346		
B	9	1	H-3	1" FIXED TYPE HGR	25-42-346		
B	10	1	H-57	1" SWING TYPE HGR	MO 257726 S.22 L.1		
B	11	1	H-14	4" SWING TYPE HGR W/2EX LEGS	25-49-416		
B	12	1	H-14	5" SWING TYPE HGR W/2 EX LEGS	25-49-426		
B	13	1	H-11	5" SWING TYPE HGR W/EX LEG	25-46-426		
F	14	1	SH-6	SIZE 4" HOT LOAD 85# VERT MOVE COLD-HOT .16" DN	P.O. (60) 6552-C16	MD-PS	
F	15	1	SH-7	5" 120# .16" DN	(61)		
B	16	1	RH-1	1" ROD HANGER	MO 257726 S.25 L.1	ST-PS	
B	17	1	TR-4	2½ TIE ROD	MO 257726 S.25 L.7		
	18						

REMARKS –

SERVICE – REDUCED PRESS ST

PS-163

GROUP NO. 6450-0105-1013 SI SHT 5 OF 6

APPLICABLE HULLS 613C 614C

DWG NO. 6450-741 SHEET 12A REV. F

NN 3569

INSTALLATION GROUP

REV.	LINE	ITEM NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	150'-0"	P6	1" IPS × STD THK STL PIPE	S/ 57-06-104	ST-PS	
		2	56'-0"	P-11	¾" IPS × "X" HVY STL PIPE	S/ 57-07-103		
		3	20	F100	1" 90° ELL SW STL 3000#	S/ 25-60-008		
		4	11	F101	¾" 90° ELL SW STL 3000#	S/ 25-60-007		
		5	1	F102	1" TEE SW STL 3000#	S/ 25-60-079		
		6	2	F103	1"×1"×¾" TEE SW STL 3000#	S/ 25-60-234		
		7	1	F104	1"×¾"×¾" TEE SW STL 3000#	S/ 25-60-238		
		8	4	F105	1"×¾" INS RED SW STL 3000#	S/ 25-60-368		
		9	5	F106	1" FLANGE SW STL 300# R.F.	S/ 25-18-834		
		10	1	F107	1" BOSS SW STL	S/ 25-02-226		
		11	1	F108	1"×1"×½" TEE SW STL 3000#	S/ 25-60-235		
		12	1	V-4017	¾" GLOBE STOP VLV SW STL 600#	S/ 26-09-276		
		13	1	V-4018	¾"			
		14	1	V-4019	¾"			
		15	1	V-4020	¾"			
		16	1	V-4021	1"	S/ 26-09-277		
		17	1	V-4022	1"			
		18	17	H-12	1" SWING HGR	S/25-47-346		
		19	7	H-12	¾" SWING HGR	S/25-47-326		

REMARKS –

SERVICE – REDUCED PRESS STM

PS-163

GROUP NO. 6450-0105-1013 SI SH6 OF6

APPLICABLE HULLS 613C 614C

DWG NO. 6450-741 SHEET 12B REV. F

NN 3569

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P3AV	3" IPS × STD THK PIPE STL	PMO 6450-742	PS	
	2	1	P5AQ	1½" IPS			
	3	1	P5AS				
	4	1	P5AW				
	5	1	P5AX				
	6	1	P5AY				
C	~~7~~	~~1~~	~~P7AT~~	~~10" IPS~~			
C	~~8~~	~~1~~	~~P7AU~~				
	9	72"	P6	1" IPS	K57-06-104		
	10	12"	P9	½" IPS × "X" HVY THK PIPE STL	K57-07-102		
	11	23'-0"	P10	¼" IPS	K57.07.100		
	12	30'-0"	P11	¾" IPS	K57.07.103		
	13						
	14		VALVE NO.				
	15	1	V-86	1" GLOBE STOP 600# S.W. STL	ON PIPE DET 6450-742	PS	
	16	1	V-87				
	17	1	V-88				
	18	1	V-116	1½"	ON PIPE DET 6450-742		
	19	1	V-117	1½"			

SERVICE – REDUCED PRESS ST

PS-166

GROUP NO. 6450-0113-1014 SI SHT 1 OF 4

APPLICABLE HULLS 613C 614C

DWG NO. 6450-741 SHEET 13 REV. C

NN 3569

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V-132	1" GLOBE STOP 600# SW. STL	ON PIPE DET 6450-742	PS	
	2	1	V-133				
	3	1	V-134				
	4	1	V-144	6"×8" ANGLE RELIEF 300#× 150# FLG STL (SET@168 PSIG)	ON PIPE DET 6450-742		
	5	1	V-4010	½" GLOBE STOP 600# SW. STL	S/ 26-09-275	ST-PS	
	6	1	V-4015	½"			
	7		FITTING NO.				
E	8	8	6ES1	¾" 90° ELBOW 3000# S.W. STL	PO ④ 6200-M12	MD-PS	
	9	2	10ES1	1"	⑤		
	10	2	2US2	¼" UNION 3000# SCR'D STL	㊸		
	11	2	5BRS1	½"×¼" INSERT RED 3000# S.W STL	㊶		
	12	1	F1	PRESS CONTROLLER (FOR V141 ON REF 10)	PO (9A) 6450-C10		
	13	1	25BRS1	1¼"×1" INSERT RED. 3000# SW STL	2560-373	ST-PS	
	14	1	100WS1	10" BACKING RING STL (STD)	97-18-141		
	15	3	30WS1	3"	97-18-126		
B	16	24'	F-2	3"×3"×⅜" STL ANGLE	MO 257726 S.3 L14		
	17						
	18						

REMARKS –

SERVICE – REDUCED PRESS ST

PS-166

GROUP NO. 6450-0113-1014 SI SHT 2 OF 4

APPLICABLE HULLS 613C 614C

DWG NO. 6450-741 SHEET 14 REV. E

NN 3569

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	FLANGE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	6	6JS3	¾" FLANGE 150# S.W. STL	PO ㉙ 6450-C34	MD-PS	
	2	1	14JS3	1½"	㉚		
	3						
	4						
	5		HANGER Nº				
B	6	1	H-11	1½" SWING TYPE HGR	25-46-366	ST-PS	
B	7	3	H-11	1½" SWING TYPE HGR W/EX LEG	25-46-366		
B	8	1	H-12	1½" SWING TYPE HGR	25-47-366		
B	9	3	H-12	¾" SWING TYPE HGR	25-47-336		
B	10	1	H-13	10" SWING TYPE HGR W/2 EX LEGS	25-48-466		
B	11	1	H-11	¾" SWING TYPE HGR W/EX LEG	25-46-336		
F	12		SH-8	SIZE 10" HOT LOAD 923 VERT MOVE COLD-HOT .86" DN	PO (62) 6552-C16	MD-PS	
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS –

SERVICE – REDUCED PRESS ST

PS-166

GROUP NO. 6450-0113-1014 SI SHT 3 OF 4

APPLICABLE HULLS 613C 614C

DWG NO. 6450-741 SHEET 15 REV. F

NN 3569

INSTALLATION GROUP

REV.	LINE	LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
G		1	206'-0"	P11	¾" IPS × "X" HVY THK PIPE STEEL	S/ 57-07-103	ST-PS	
		2						
G		3	1	V-4046	¾" GLOBE STOP V. S.W. 600#	S/ 26-09-276	ST-PS	
G		4	1	V-4047				
G		5	1	V-4048				
G		6	1	F-50	¾" BOSS STEEL S.W. × WELD BASE	S/ 25-02-224		
G		7	15	F-51	¾" COUPLING S.W. STEEL 3000#	P.O. ⑰ 6200-M12		
G		8	1	F-52	¾" TEE STEEL S.W. 3000#	S/ 25-60-078		
G		9	3	F-53	¾" 90° ELBOW S.W. 3000#	S/ 25-60-007		
G		10	2	F-54	¾" "Y" STRAINER SCR'D STEEL	S/ 26-03-122		
G		11	8	F-55	¾" 90° ELBOW SCR'D MALLEABLE IRON	S/ 25-09-196		
G		12	2	F-56	¾" TEE SCR'D MALLEABLE IRON	S/ 25-11-176		
G		13	2	F-57	¾" UNION SCR'D MALLEABLE IRON	S/ 25-12-166		
G		14	1	F-58	COAMING- o/f 2½" X HVY STL PIPE- 4" LG.	S/ 57-07-108		
G		15	16	H-11	¾" SWING TYPE HGR SINGLE LEG	S/ 25-46-336		
G		16	7	H-12	¾" SWING TYPE HGR DOUBLE LEG	S/ 25-47-336		
		17						
		18						

REMARKS –

SERVICE – REDUCED PRESS ST

PS-164

GROUP NO. 6450-0113-1014 SI SHT 3A OF 4

APPLICABLE HULLS 613C 614C

DWG NO. 6450-741 SHEET 15A REV. G

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (I) SHIP	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	4	1421	1 1/2"	BOLTS	1/2" HVY HEX HD STL L=2 1/4"	6000-C7 ㉛	MD-PS	
	2	4			NUTS	1/2" HVY HEX STL	6000-C11 ①		
	3	1			GSKT	1/16" THK COMPR ASB 150#	15-01-268E	ST-PS	
	4	24	621	3/4"	BOLTS	1/2" HVY HEX HD STL L=2"	6000-C7 ㉜	MD-PS	
	5	24			NUTS	1/2" HVY HEX STL	6000-C11 ①		
	6	6			GSKT	1/16" THK COMPR ASB 150#	15-01-262E	ST-PS	
	7		○		BOLTS				
	8				NUTS				
	9				GSKT				
	10		○		BOLTS				
	11				NUTS				
	12				GSKT				
	13		○		BOLTS				
	14				NUTS				
	15				GSKT				
	16		○		BOLTS				
	17				NUTS				
	18				GSKT				
	19		○		BOLTS				
	20				NUTS				
	21				GSKT				
	22		○		BOLTS				
	23				NUTS				
	24				GSKT				
	25		○		BOLTS				
	26				NUTS				
	27				GSKT				
	28		○		BOLTS				
	29				NUTS				
	30				GSKT				
	31		○		BOLTS				
	32				NUTS				
	33				GSKT				
	34		○		BOLTS				
	35				NUTS				
	36				GSKT				
	37		○		BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - REDUCED PRESS ST

PS-166

GROUP NO. 6450-0113-1014 SI
SHEET 4 OF 4

APPLICABLE HULLS	613C	614C	DRG NO.	SHEET	REV.
			6450-741	16	A

INSTALLATION GROUP

REV.		LINE NO.	QTY (I SHIP)	PIPE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C		1	1	P7AT	10"IPS x STD THK PIPE STL	PMO 6450-742	PS	
C		2	1	P7AU	↓	↓	↓	
		3						
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - REDUCED PRESS ST

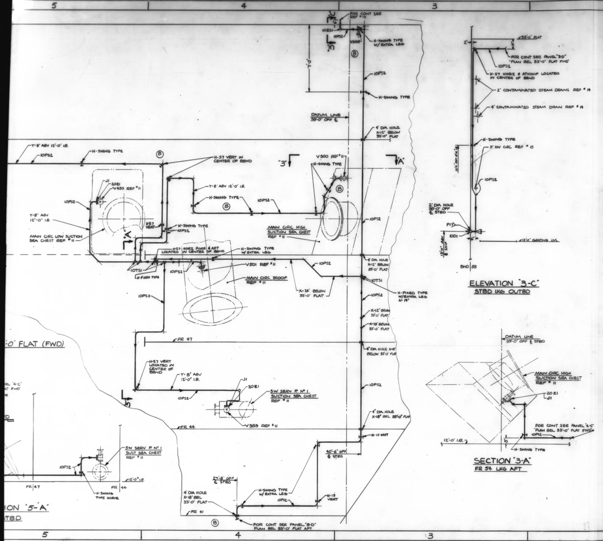
PS-162

GROUP NO. 6450-0110-1005 PI

APPLICABLE HULLS	613C	614C	DRG NO.	SHEET	REV.
			6450-741	17	C

6450-741

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade mark of KEUFFEL & ESSER CO.
SEPT. '80
FRAME
8X


ELEVATION "3-C"
STBD LKG OUTBD
SECTION "3-A"
FR 54 LKG AFT
ION "5-A"
STBD
-0" FLAT (FWD)
FOR CONT SEE REF # 13
FOR CONT SEE PANEL "3-D" "PLAN BEL 33'-0" FLAT FWD"
FOR CONT SEE PANEL "4-C" "PLAN BEL 33'-0" FLAT FWD"
FOR CONT SEE PANEL "8-D" PLAN BEL 33'-0" FLAT AFT
DATUM LINE 33'-0" OFF ℄
DATUM LINE 33'-0" OFF ℄ STBD
H-SWING TYPE
H-SWING TYPE W/ EXTRA LEG
H-FIXED TYPE W/EXTRA LEG X=14"
H-57 VERT IN CENTER OF BEND
H-57 HORIZ FORE & AFT LOCATED IN CENTER OF BEND
H-57 HORIZ & ATHSHIP LOCATED IN CENTER OF BEND
H-13 VERT
Y=8" ABV 12'-0" I.B.
MAIN CIRC LOW SUCTION SEA CHEST REF # 11
MAIN CIRC HIGH SUCTION SEA CHEST REF # 11
MAIN CIRC SCOOP REF # 11
SW SERV P. Nº 1 SUCTION SEA CHEST REF # 11
SW SERV P. Nº 1 SUCT SEA CHEST REF # 11
V500 REF # 11
V501 REF # 11
V389 REF # 11
V499 REF # 11
2" CONTAMINATED STEAM DRAINS REF # 14
4" CONTAMINATED STEAM DRAIN REF # 14
3" SW CIRC REF # 15
4" DIA HOLE X=12" BELOW 33'-0" FLAT
4" DIA HOLE X=18" BEL 33'-0" FLAT
2" DIA HOLE 38'-0" OFF ℄ STBD
40'-6" OFF ℄ STBD
27'-8" OFF ℄ STBD
33'-0" FLAT
12'-0" GRATING LVL
12'-0" I.B.
10PS2
10ES1
10TS1
10D1
2081
2021
J1
FR 41
FR 44
FR 47
FR 54
BHD 58

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
A	-	INITIAL ISSUE.	1/21/6	[illegible]	-	-
B	4C 5C 6C 3D 4A,10 10B 11B	DESIGN DEVELOPMENT: 10PS1 FR 50 - FR 54 P/S ALTERED TO SUIT FUEL OIL PIPING AND AUX CONDENSER FDN. V5007 RELOCATED. HOLE CUT RELOCATED FR 38 & 41 STBD HOLE CUT ALTERED FR 29 PORT ADDED 'SECT 11-B'. RBW	4/4/6	[illegible]	—	—
C	9B 8A 15	ALT'D PIPING TO DIST PLT SW. SUCT SEA CHEST. ADDED PIPE TO OIL SENSORS	4/2/7	[illegible]	—	—
D		PLAN MADE APPLICABLE TO H615	6/22/7	[illegible]	—	-
E	15	ADDED DRAINS FROM OIL SENSORS SUPPLY.	12/6/15	[illegible]	—	—

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN IS DEVELOPED IN ACCORDANCE WITH REFERENCE Nº 1 & 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE US COAST GUARD AND ABS. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF # 2.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE US COAST GUARD, ABS AND REF 5.
4. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS: SOCKET WELDS TYPE P-14 AND FLANGE WELDS TYPE P-16A ON REF 5 EXCEPT AS OTHERWISE INDICATED.
5. COUPLINGS LISTED IN MATERIAL LIST ARE TO BE USED AS REQUIRED.
6. PIPE SIZES SPECIFIED ARE NOMINAL IRON PIPE SIZES.
7. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF PUMPS, HEAT EXCHANGERS, ETC.
8. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN. ALL BENDING RADII SHALL BE 5 TIMES THE NOMINAL DIAMETER.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REF 4.
10. TESTS ARE TO BE IN ACCORDANCE WITH REF 2.
11. PAINTING IS TO BE IN ACCORDANCE WITH REF 6.
12. INSULATION AND LAGGING SHALL BE IN ACCORDANCE WITH REF. 8.
13. ALL HOLE CUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.
14. HANGERS INDICATED ON THIS PLAN ARE TO BE INSTALLED WITHIN 6' OF POSITION SHOWN. ADDITIONAL HANGERS LISTED IN LIST OF MATERIAL ARE TO BE USED AS REQUIRED TO SUPPORT PIPING IN ACCORDANCE WITH REF 7.
15. "X" DIMENSIONS AS SHOWN ARE TAKEN FROM THE ℄ OF PIPE TO UNDERSIDE OF DECK ABOVE. "Y" DIMENSIONS AS SHOWN ARE TAKEN FROM ℄ OF PIPE TO NEAR SIDE OF DECK BELOW.
16. ALL PIPING ON THIS ARRANGEMENT IS CLASS II.

FOR LIST OF MATERIAL SEE NN DRAWING 6450-744

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS	ABS
	USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689

INSTALLATION GROUP : 6450-0101-1001 SI

PIPE DETAIL DRAWING - 6450-745

NO.	REFERENCES	DWG NO.
16	PIP ARR OIL/WATER SEPARATOR	2280-715
15	PIPING ARR SW COOLING CARGO, FIRE & BALL. P. TURB	[illegible]
14	PIPING ARR CONTAM STM DRAIN SYS ENG RM ARR	[illegible]
13	STEAM, EXH, LAD & GRTG IN AFT PUMP ROOM ARR	6450-679
12	PIPING ARR FUEL OIL SERVICE DISCHARGE	6950-100
11	ARR SUCTION SEA CHESTS IN ENGINE ROOM	6000-317
10	PIPING ARR REL VLV ESC ENG RM - PLAN, SECT [illegible]	[illegible]
9	PIPING ARR [illegible] CONTAMINATED STM SYS ER	[illegible]
8	DIRECTIONS FOR INSULATING & LAGGING PIPES & MACH	257322
7	STANDARD PIPE HANGERS	257056
6	PAINTING SCHEDULE	[illegible]
5	FAB & WELDING INSTRUCTIONS FOR CL I & II PIPING SYS	257035
4	TYP ARR OF GAGE PIPING	6750-481
3	LIST OF PRESSURE & VAC GAGES FURN BY SHIPYARD	6750-483
2	DIAGRAM CONTAMINATED STEAM GEN SYS - LIST	6450-693
1	DIAGRAM CONTAMINATED STEAM GEN SYS - ARR	6450-692

✱ H613C & 614C
● H615C

SCALE ½" = 1 FT
DRAWN R. B. WEISS
CHECKED TE SEAMAN
SECT MGR J. H. Johnson
DATE COMPL. 1-20-76
EXAMINED
AUTHORIZED
DATE 1-21-76
TECH APPROVAL 1-20-76 DBM
CSD APPROVAL R. L. Harrington

PIPING ARRANGEMENT
125 PSI CONTAMINATED STM SYS
ENG RM - PLAN, SECT & ELEV

USMA DESIGN T11-S-116A
USMA DWG NO.
HULL NO.

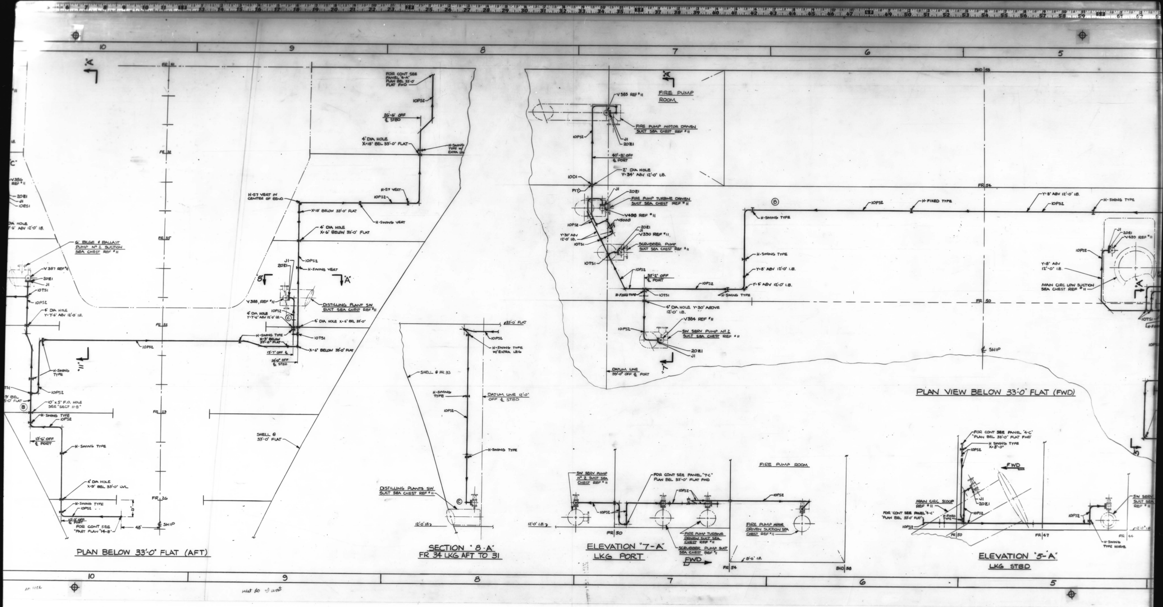
DWG NO. 6450-743 REV E SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS YES NO
GROUP:
MC NO.

6450.743

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 1
10X



10
9
8
7
6
5
"A"
FR 41
FR 38
FR 35
FR 32
FR 29
FR 26
FOR CONT SEE PANEL "6-A" PLAN BEL 33'-0" FLAT FWD
10PS2
26'-6" OFF ℄ STBD
4" DIA HOLE X-18" BEL 33'-0" FLAT
H-SWING TYPE W/ EXTRA LEG
H-57 VERT
H-57 VERT IN CENTER OF BEND
X-18" BELOW 33'-0" FLAT
H-SWING VERT
4" DIA HOLE X-6" BELOW 33'-0" FLAT
6" BILGE & BALLAST PUMP Nº 2 SUCTION SEA CHEST REF #11
V 387 REF #11
2021
J1
10TS1
V 386 REF #11
10ES1
4" DIA HOLE Y-7'-6" ABV 12'-0" I.B.
"B"
"A"
V 388 REF #11
DISTILLING PLANT SW SUCT SEA CHEST REF #11
4" DIA HOLE Y-7'-6" ABV 12'-0" I.B.
4" DIA HOLE X-6" BEL 33'-0"
H-SWING TYPE X-3" BELOW 33'-0" FLAT
13'-7" OFF ℄
16'-0" OFF ℄ STBD
X-6" BELOW 33'-0" FLAT
H-SWING TYPE
10'x5" F.O. HOLE SEE "SECT 11-B"
H-SWING TYPE
13'-6" OFF ℄ PORT
4" DIA HOLE X-9" BEL 33'-0" LVL
12'-3" OFF ℄ PORT
FOR CONT SEE "PART PLAN "14-B"
48"
℄ SHIP
SHELL @ 33'-0" FLAT
PLAN BELOW 33'-0" FLAT (AFT)
33'-0" FLAT
H-SWING TYPE W/EXTRA LEG
SHELL @ FR 33
H-SWING TYPE
DATUM LINE 12'-0" OFF ℄ STBD
DISTILLING PLANTS SW SUCT SEA CHEST REF #11
12'-0" I.B.
SECTION "8-A"
FR 34 LKG AFT TO 31
FIRE PUMP ROOM
V 385 REF #11
FIRE PUMP MOTOR DRIVEN SUCT SEA CHEST REF #11
40'-8" OFF ℄ PORT
2" DIA HOLE Y-34" ABV 12'-0" I.B.
1001
P17
FIRE PUMP TURBINE DRIVEN SUCT SEA CHEST REF #11
V498 REF #11
N5008
Y-30" ABV 12'-0" I.B.
V330 REF #11
SCRUBBER PUMP SUCT SEA CHEST REF #11
35'-2" OFF ℄ PORT
H-FIXED TYPE
4" DIA HOLE Y-30" ABOVE 12'-0" I.B.
V384 REF #11
SW SERV PUMP Nº 2 SUCT SEA CHEST REF #11
DATUM LINE 33'-0" OFF ℄ PORT
BHD 58
FR 54
FR 50
H-FIXED TYPE
Y-8" ABV 12'-0" I.B.
H-SWING TYPE
Y-8" ABV 12'-0" I.B.
Y-4" ABV 12'-0" I.B.
V433 REF #11
MAIN CIRC LOW SUCTION SEA CHEST REF #11
℄ SHIP
PLAN VIEW BELOW 33'-0" FLAT (FWD)
SW SERV PUMP Nº 2 SUCT SEA CHEST REF #11
FOR CONT SEE PANEL "7-C" PLAN BEL 33'-0" FLAT FWD
FIRE PUMP ROOM
FIRE PUMP TURBINE DRIVEN SUCT SEA CHEST REF #11
SCRUBBER PUMP SUCT SEA CHEST REF #11
FIRE PUMP MOTOR DRIVEN SUCTION SEA CHEST REF #11
8'-6" I.B.
ELEVATION "7-A"
LKG PORT
FWD
BHD 58
FOR CONT SEE PANEL "4-C" "PLAN BEL 33'-0" FLAT FWD"
H-SWING TYPE X-8"-0"
FWD
MAIN CIRC SCOOP REF #11
FOR CONT SEE PANEL "4-C" "PLAN BEL 33'-0" FLAT"
H-FIXED TYPE
FR 47
FR 44
SW SERV SUCT SEA REF #11
H-SWING TYPE HORIZ
12'-0" I.B.
ELEVATION "5-A"
LKG STBD
what do I want

6450.743

MICRO-MASTER 105 mm

K+E

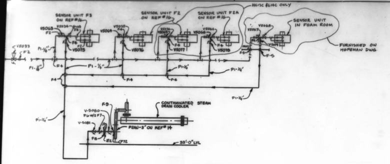
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

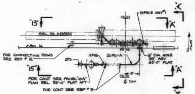
FRAME 2

10X

15 14 13 12 11 10

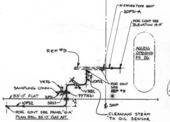

SENSOR UNIT F3 ON REF #16
SENSOR UNIT F2 ON REF #16
SENSOR UNIT F2A ON REF #16
H613C & 614C ONLY
SENSOR UNIT IN FOAM ROOM
FURNISHED ON HOPEMAN DWG
V5033
V5063
V5064
V5065
V5066
V5067
V5068
V5075
V5076
V5077
V5078
P1-1/4"
F2
F4
F5
CONTAMINATED STEAM DRAIN COOLER
F9
V-5080
V-5081
P2AN-3" OU REF #14
33'-0" LVL

DIAGRAMMATIC ARRGT OF CLEANING STEAM TO OIL DETECTOR SENSORS


"13"
"15"
"A"
"14"
FUEL OIL HEATERS
20PS1-B ASSY #1
FOR CONNECTING PIPING SEE REF #12
2PS1
10PS2
20PS1-A
6" DIA HOLE 38" ABV 33'-0" FLAT
FOR CONT SEE PANEL "10-A" PLAN BEL 33'-0" FLAT AFT
FOR CONT SEE REF #9
℄ SHIP
FWD

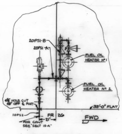
PARTIAL PLAN "14-B"

60'-0" FLAT TO 33'-0" FLAT


H-SWING TYPE VERT
20PS1-A
FOR CONT SEE "ELEVATION 14-A"
ACCESS OPENING FR 26
REF #9
FOR CONT SEE REF #9
V476
SAMPLING CONN
V382
77TRS1
10PS2
2PS1
5RS3
33'-0" FLAT
℄ SHIP
FOR CONT SEE PANEL "10-A" PLAN BEL 33'-0" FLAT AFT
CLEANING STEAM TO OIL SENSOR UNITS FOR BILGE & BALLAST SYSTEMS. SEE PANEL "15-D"

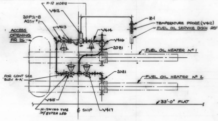
SECTION "15-A"

FR 25 LKG FWD TO 26


20PS1-B
20PS1-A
FUEL OIL HEATER Nº 1
FUEL OIL HEATER Nº 2
4½" HOLE CUT 48" OFF ℄ PORT
10PS2
FR 26
FOR CONT SEE SECT 15-A
33'-0" FLAT
FWD

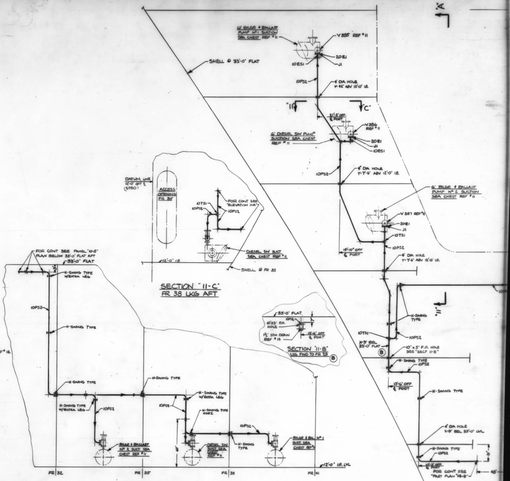
ELEVATION "14-A"

STBD LKG TO PORT


H-12 HORIZ
V412
20PS1-B ASSY #1
ACCESS OPENING FR 26
V413
V414
V416
2021
Z-1
TEMPERATURE PROBE (V412)
FUEL OIL SERVICE DISCH REF #12
FUEL OIL HEATER Nº 1
FUEL OIL HEATER Nº 2
FOR CONT SEE ELEV 14-A
V415
V417
H-SWING TYPE W/EXTRA LEG
℄ SHIP
33'-0" FLAT

SECTION "13-A"

FR 27 LKG AFT TO 26


"A"
"11"
"C"
6" BILGE & BALLAST PUMP Nº 1 SUCTION SEA CHEST REF #11
V385 REF #11
2021
J1
10ES1
10PS2
SHELL @ 33'-0" FLAT
4" DIA HOLE Y-4½" ABV 12'-0" 18.
21'-3" OFF ℄ PORT
6" DIESEL SW PUMP SUCTION SEA CHEST REF #11
V386 REF #11
4" DIA HOLE Y-7'-6" ABV 12'-0" 18.
6" BILGE & BALLAST PUMP Nº 2 SUCTION SEA CHEST REF #11
V387 REF #11
10TS1
18'-10" OFF ℄ PORT
DATUM LINE 12'-0" OFF ℄ (STBD)
ACCESS OPENING FR 35
FOR CONT SEE "ELEVATION 11-A"
DIESEL SW SUCT SEA CHEST REF #11
SHELL @ FR 38
12'-0" 18
FOR CONT SEE PANEL "10-B" PLAN BELOW 33'-0" FLAT AFT
33'-0" FLAT
H-SWING TYPE W/EXTRA LEG
H-SWING TYPE
10PS2
H-SWING TYPE HORZ
BILGE & BALLAST Nº 2 SUCT SEA CHEST REF #11
DIESEL SW SUCT SEA CHEST REF #11
BILGE & BAL Nº 1 SUCT SEA CHEST REF #11
12'-0" 18. LVL
FR 32
FR 35
FR 38
FR 41
10"X5" F.O. HOLE
1½" STM DRAIN REF #14
13'-6" OFF ℄ PORT
X-9" BEL 33'-0" FLAT
10"X5" F.O. HOLE SEE "SECT 11-B"
4" DIA HOLE X-9" BEL 33'-0" LVL
FOR CONT SEE "PART PLAN 14-B"
48"

SECTION "11-C"

FR 38 LKG AFT

SECTION "11-B"

LKG FWD TO FR 25

ELEVATION "11-A"

℄ LKG STBD

PLAN BELOW 33'

15 14 13 12 11 10

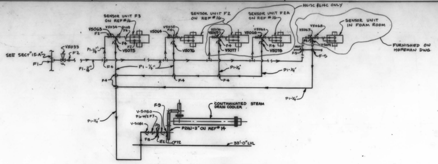
6450.743

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

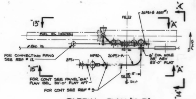
SEPT. '80

10X

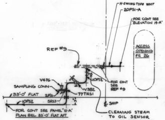
FRAME 3


H613C & 614C ONLY
SENSOR UNIT F3 ON REF #16
SENSOR UNIT F2 ON REF #16
SENSOR UNIT F2A ON REF #16
SENSOR UNIT IN FOAM ROOM
FURNISHED ON HOPEMAN DWG
V5063
F2
V5034
(TYP)
F4
F4
F2
V5075
V5064
V5035
F4
V5076
V5036
V5065
F4
V5077
V5066
V5062
F4
V5078
V5067
V5068
F4
V5079
F-5
F-5
SEE SECT "15-A"
V5033
F2
F1
P1-1/4"
P1-1/4"
F4
P1 - 1/4"
P1-1/4"
P1-1/4"
F-4
F-4
F-4
P1-1/4"
P1-1/4"
CONTAMINATED STEAM DRAIN COOLER
F-9
V-5080
F6 W/2 F7
V-5081
P2AN-3" ON REF #14
F8
Z2
P72
33'-0" LVL

DIAGRAMMATIC ARRGT OF CLEANING STEAM TO OIL DETECTOR SENSORS

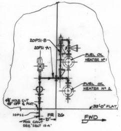

"13"
"A"
"A"
"A"
"15"
"14"
FR 27
20PS1-B ASSY #1
FUEL OIL HEATERS
BHD 26
FR 26
FWD
FOR CONNECTING PIPING SEE REF # 12
10PS2
20PS1-A
2PS1
6" DIA HOLE 38" ABV 33'-0" FLAT
18"
FR 15
℄ SHIP
FOR CONT SEE PANEL "10-A" PLAN BEL 33'-0" FLAT AFT
FOR CONT SEE REF # 9

PARTIAL PLAN "14-B"
60'-0" FLAT TO 33'-0" FLAT

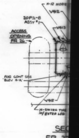

H-SWING TYPE VERT
20PS1-A
FOR CONT SEE "ELEVATION 14-A"
REF #9
ACCESS OPENING FR 26
10PS2
FOR CONT SEE REF #9
V476
SAMPLING CONN
V382
33'-0" FLAT
2PS1
77TRS1
10PS2
SRS3
℄ SHIP
FOR CONT SEE PANEL "10-A" PLAN BEL 33'-0" FLAT AFT

CLEANING STEAM TO OIL SENSOR UNITS FOR BILGE & BALLAST SYSTEMS. SEE PANEL "15-D"

SECTION "15-A"
FR 25 LKG FWD TO 26


20PS1-B
20PS1-A
FUEL OIL HEATER No 1
FUEL OIL HEATER No 2
4 1/2" HOLE CUT 48" OFF ℄ PORT
33'-0" FLAT
10PS2
FR 26
21"
FWD
FOR CONT SEE "SECT 15-A"

ELEVATION "14-A"
STBD LKG TO PORT


H-12 HORIZ
V412
20PS1-B ASSY #1
V413
ACCESS OPENING FR 26
FOR CONT SEE "ELEV 14-A"
V415
H-SWING TYPE W/ EXTRA LEG

SEC
FR 27

6450.743

SEPT. '80
FRAME 4
10X

6450.744

[redacted] VAULT
CSD X 163

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 12-6-8
SIGNED

REVISIONS — REFER TO SHEET NO. 2

YARD PRINTS / ORDERED BY DESIGN

REV. STATUS OF SHEETS	REV.	D	D	C	C	D	D	D
	SHEET	1	2	3	4	5	6	7

REV.
SHEET
GROUP
MC NO.

NNS&DDCo. HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C 614C 613C	310 309	T11-S-116A	

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	NO

APPROVALS
OWNERS
ABS
USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division
FSCM NO. 43689

COMMERCIAL SHIP DESIGN DEPARTMENT

FOR PIPING ARRANGEMENT SEE DWG 6450-743
PIPE MATERIAL ORDER 6450-745
INSTALLATION GROUP 6450-0101-1001 SI

GROUPED / BY / CHK.
DATES / COMP. / PART
HULL 613C, 615C / GROUP NO. / KEY

SCALE NONE = 1 Ft.
DRAWN R.B. WEISS
CHECKED T.E. SEAMAN
SECT. MGR. J. R. Johnson
DATE COMPL. 1-21-76
EXAMINED
AUTHORIZED
DATE 1-21-76
TECH. APPROVAL NR
CSD APPROVAL R.L. Harrington

TYPE OF DWG. —

TITLE PIPING ARR - 125 PSI
CONTAMINATED STM SYS ENG RM
LIST OF MATERIAL

DWG. NO. 6450-744
REV D
SHEET NO. 1 OF 7

NN 8½ X 14

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE. RJP	1/21/6		—	—
B	3 6	LINE 3 MADE "X-HVY" ADDED	2/21/7	AC	—	—
C	ALL	PLAN MADE APPLICABLE TO H615C	6/27/7		—	—
D	5 6 7	ADDED LINES 7, 8, + 9. INCREASED QTY'S LINES 14, 15, 16, + 18 QTY'S WERE 15, 9, 1, & 150'. ADDED ITEMS 1-12. ERS	12/4/8	AC	—	—

GENERAL NOTES

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF #1.

NO.	REFERENCES	DWG. NO.
2.	PIPING ARR 125 PSI CONTAM STM SYS ENG RM PLAN, SECT & ELEV	6450-743
1.	DIAGRAM CONTAMINATED STEAM GEN SYSTEM · LIST	6450-693

HULL NO. 613C, 614C, 615C
DWG. NO. 6450-744
SHEET 2 OF -

NN 46 8½ X 14

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM №	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	ASSY #1	1	1	20PS1-A	2" IPS X STD THK PIPE STL	PIPE DET 6450-745	PS	
		2	1	20PS1-B				
B		3	300'	10PS2	1" IPS "X" HVY THK	K57-07-104		
		4	9"	2PS1	¼" IPS X "X" HVY THK	K57-07-100		
		5						
		6						
		7						
		8	1	V-382	1" GLOBE STOP CHK 600# SW STL	PO ① 6450-C28	MD-PS	
	ASSY #1	9	1	V-412	1½" TEMP REG, 150# FLG, STL	ON PIPE DET 6450-745	PS	
		10	1	V-413	2" GLOBE STOP, 600# SW, STL			
		11	1	V-414	2" GATE			
		12	1	V-415	2" GLOBE STOP			
		13	1	V-416	2"			
		14	1	V-476	¼"	PO ② 6450-C28	MD-PS	
		15	1	V-5007	1"	PO ⑧ 6450-M9		
		16	1	V-5008	1"	⑧		
	ASSY #1	17		V417	2" GLOBE STOP, 600# SW STL	ON PIPE DET 6450-745	PS	
		18						

REMARKS -

SERVICE - 125 PSI CONTAM STM SYS - ER.
MC NO = PS-170
GROUP NO. 6450-0101-1001 SI SHT 1 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-744 SHEET 3 REV. C

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM №	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	77TRS1	1"X1"X½" RED TEE 3000# S.W. STL	6200-M12 ⑫ 6200-M12 ㊳	MD-PS	
		2	1	5RS3	½"X¼" INSERT RED	㊶ 6200-M12		
		3	12	10TS1	1" TEE, 3000# S.W, STL	⑫		
		4	3	10ES1	1" ELL 90°,	⑤		
		5	2	10D1	1" BHD SLEEVE STL ⑤ 216522	2520-178	ST-PS	
		6						
		7						
		8	12	J-1	2" SPEC FLG 150# SLIP-ON STL (BORE FOR 1")	PO ㉜ 6450-M2	MD-PS	
		9						
		10						
		11	5	H-2	2" FIXED HANGER W/LINER (¼" ASBESTOS TAPE PLAIN WEAVE)	S 25-41-376	ST-PS	
		12	4	H-7	1" SWING HANGER W/LINER (¼" ASBESTOS TAPE PLAIN WEAVE)	S 25-45-346		
		13	15	H-11	1"	S 25-46-346		
		14	33	H-12	1"	S 25-47-346		
		15	17	H-13	1"	S 25-48-346		
		16	7	H-57	1"	MO 283176 S7 L1		
		17						
		18						

REMARKS -

SERVICE - 125 PSI CONTAM STM SYS - E.R.
MC NO - PS=170
GROUP NO. 6450-0101-1001 SI SHT 2 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-744 SHEET 4 REV. C

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	56	2021	2"	BOLTS	⅝" HVY HEX HEAD L=2½"	6000-C7 ㉗	MD-PS	
	2	56			NUTS	⅝" HVY HEX	21-33-202	ST-PS	
	3	14			GSKT	1/16" COMPRESSED ASBESTOS	15-01-270E		
	4	4	Z-1	1"	BOLTS	⅝" HVY HEX HEAD L=2¾"	6000-C7 ㉖	MD-PS	
	5	4			NUTS	⅝" HVY HEX	21-33-202	ST-PS	
	6	1			GSKT	1/16" COMPRESSED ASBESTOS	15-01-264E		
D	7	4	Z-2	¼"	BOLTS	½" HVY HEX HEAD L=2"	PO 6000-C7 ㉜	ST-PS	
D	8	4			NUTS	½" HVY HEX	PO 2600-C78 ①		
D	9	2			GSKT	1/16" COMP ASBESTOS 150#	CUT FROM SY/15-02-224		
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - 125 PSI CONTAM STM SYS - ENG RM
MC NO - PS=170
GROUP NO. 6450-0101-1001 SI SHT 3 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-744 SHEET 5 REV. D

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V5033	¼" GLOBE STOP CHECK VALVE BRONZE SCRD	PO 2600-C51A ⑤	MD-PS	
		2	1	V5034	¼" SOLENOID VALVE SCRD. STAINLESS STL	PO 2400-C22 (1-F)		
		3	1	V5035		(2-E)		
		4	* 1	V5036		(2-E)		
		5	* 1	V5062		(2-E)		
		6						
		7	1	V5063	¼" GLOBE STOP VALVE BRONZE SCRD	S 26-09-142	ST-PS	
		8	1	V5064				
		9	* 1	V5065				
		10	* 1	V5066				
		11						
		12	1	F1	1X1X¼ TEE STL. S.W.	S 25-60-237		
		13	21	F2	¼" UNION STL. SCRD	S 25-12-190		
D		14	30	F3	¼" COUPLING STL S.W.	S 25-60-050		
D		15	18	F4	¼" TEE STL. S.W.	S 25-60-075		
D		16	2	F5	¼" DECK SLEEVE STL	S 25-20-384		
		17						
D		18	350 FT	P1	¼" X-HVY PIPE STL.	S 57-07-100	PS	

REMARKS - * H613C & 614C ONLY

SERVICE -
MC NO = PS=170
GROUP NO. 6450-0101-1001 SI
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6450-744 SHEET 6 REV. C

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	F-6	½" Y-STRAINER SEMI-STL SCR'D	S/ 26-03-120	ST-PS	
		2	2	F-7	½"×¼" RED BUSHING STL SCR'D	S/ 25-05-208		
		3	1	F-8	⅛" SQUARE EDGE ORIFICE	MO 216670 SH12L1		
		4	2	J-2	¼" R.F. FLANGE SW STL 150#	S/ 25-18-839		
		5	1	V-5075	¼" GLOBE STOP VLV SW STL 600#	S/ 26-09-260		
		6	1	V-5076				
		7	1	V-5077				
		8	1	V-5078				
		9	1	V-5079				
		10	1	V-5080				
		11	1	V-5081				
		12	1	F-9	¼" S.W × WELD BASE BOSS STEEL	S/ 25-02-220		
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - 125 PSI CONTAM STM SYS - E.R
GROUP NO. 6450-0101-1001 SI
APPLICABLE HULLS 613C 614C
DWG NO. 6450-744 SHEET 7 REV. D

6450-744

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME

8X

6450-762

CSD-VAULT
E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING NO
DATE 9-27-8
SIGNED J.H. Johnson

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS												
REV.	B	B	A	A	A	A	A	B	A	A	B
SHEET	1	2	3	4	5	6	7	8	9	10	11

GROUP
MC NO.

DWG. REV. — HULL APPLIC.

REV.	613C	614C
A	YES	YES
B	YES	YES

NNS&DDCO HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C	310		
613C	309	TII-S-116a	

APPROVALS
OWNERS NR
ABS NR
USCG NR

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING DEPT.

SCALE 1/2 =1 Ft.
DRAWN W.J. GOLIGHTLY
CHECKED JHJ
SECT. MGR. J.H. Johnson
DATE COMPL. 6-4-76
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 6-4-76
TECH. APPROVAL NR
CSD APPROVAL EES for R.L. HARRINGTON

HULL 613C
TYPE OF DWG. — 480

TITLE
PIPE HANGERS-BOILER
PRESS. AUX STM-E.R. 480
FOR ARR DWG 6450-737

DWG. NO. 6450-762 REV B SHEET NO. 1 OF 11

REVISIONS

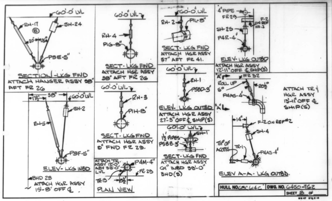
REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D.	OWNER DATE	OWNER APPD.
A	1	INITIAL ISSUE WJG	6/4/6	JHJ	—	—
B	2 8	ALT'D RH-17 & SH-24 33'-5" DIM WAS 38'-2"	9/22/8	JHJ	—	—

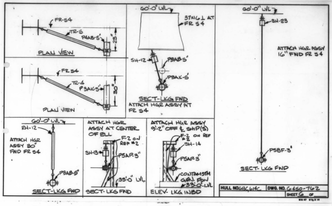
NOTES:

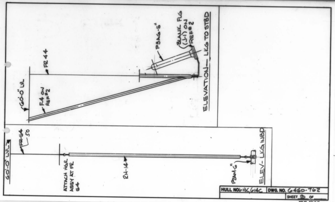
1. FOR KEY PLAN SHOWING LOCATION OF HANGERS IN SHIP SEE REF #1.
2. WHERE INDICATED, SUPPORTS, FOUNDATIONS AND REINFORCEMENTS ARE TO BE PROVIDED BY HULL DEPT.
3. HANGERS MAY BE MOVED SLIGHTLY (6" TO EITHER SIDE OF LOCATION SHOWN) TO SUIT CONDITIONS ON SHIP EXCEPT THOSE COVERED BY NOTE #2.
4. MATERIAL IS GROUPED ON REF #2.
5. ALL WELDS TO BE 1/4" FILLET.

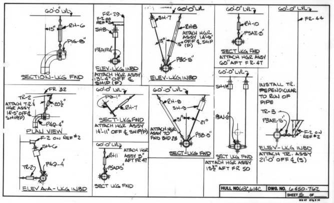
NO.	REFERENCES	DWG. NO.
	– LIST	6450-738
1	PIPING ARRGT. BOILER PRESS AUX STM-ER. PLAN, SECT & ELEV	6450-737

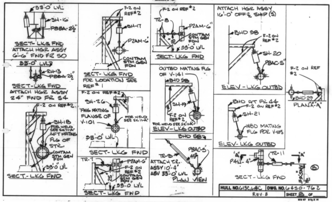
HULL NO. 613C, 614C DWG. NO. 6450-762 SHEET 2 OF

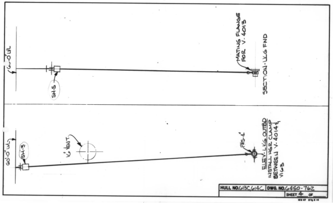

60'-0" LVL
RH-17
SH-24
P3E-5"
SECTION-LKG FWD
ATTACH HANGER ASSY 38" AFT FR 26
SH-2
RH-5
P3F-5"
ELEV-LKG INBD
BHD 28
ATTACH HGR ASSY 13'-8" OFF ℄
RH-4
P1G-8"
SECT-LKG FWD
ATTACH HGR ASSY 38" AFT FR 26
RH-3
P1H-8"
SECT-LKG FWD
ATTACH HGR ASSY 8" FWD FR 23.
ATTACH TR. ASSY 13'-0" ABV 33'-0" LVL
P4M-4"
FR 23
TR-13
PLAN VIEW
RH-2
P1L-8"
SECT-LKG FWD
ATTACH HGR ASSY 57" AFT FR 41.
RH-1
P5BD-3"
ELEV-LKG OUTBD
ATTACH HGR ASSY 27'-5" OFF ℄ SHIP(S)
1 1/2" PIPES
P5BB-3"
SECT-LKG FWD
ATTACH HGR ASSY 61" INBD 33'-0" BHD(S)
4" PIPE
FR 29
F-2 ON REF NO.2
SH-25
P4R-4"
ELEV-LKG OUTBD
ATTACH HGR ASSY 12'-11" OFF ℄ SHIP(S)
FR 32
ROLL UP 5°
P4AS-4
20 1/2°
ATTACH TR. & HGR ASSY 13'-11" OFF ℄ SHIP(S)
F-2 ON REF #2
SH-4
TR-1
TOP OF ACCESS
P4AS-4"
ELEV A-A-LKG OUTBD.
HULL NO. 613C, 614C DWG. NO. 6450-762
SHEET 3 OF

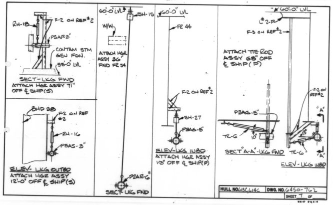

FR-54
TR-5
P4AB-5"
25"
PLAN VIEW
FR 54
TR-4
P3AK-5"
30"
PLAN VIEW
60'-0" LVL
37X16 ⊥ AT FR 54
SH-12
P3AB-5"
P3AK-5"
SECT-LKG FWD
ATTACH HGR ASSY AT FR 54
60'-0" LVL
SH-23
ATTACH HGR ASSY 16" FWD FR 54
P5BF-3"
SECT-LKG FWD
RH-12
ATTACH HGR ASSY 30" FWD FR 54
P3AB-5"
SECT-LKG FWD
ATTACH HGR ASSY AT CENTER OF ELL
F-2 ON REF #2
SH-13
P5AR-3"
33'-0" LVL
SECT-LKG FWD
ATTACH HGR ASSY 9'-2" OFF ℄ SHIP(S)
F-2 ON REF #2
SH-14
P5AR-3"
CONTAM STM GEN FDN
33'-0" LVL
ELEV-LKG INBD
HULL NO. 613C, 614C DWG. NO. 6450-762
SHEET 6 OF


60'-0" LVL
FR 44
F-4 ON REF #2
P3AG-5"
BLANK FLG (J-1) ON REF #2
ELEVATION-LKG TO STBD
60'-0" LVL
FR-54
50
ATTACH HGR ASSY AT FR 54
RH-14
P2AN-6"
ELEV-LKG INBD
HULL NO. 613C, 614C DWG. NO. 6450-762
SHEET 9 OF


60'-0" LVL
15"
RH-6
P1G-8"
SECTION-LKG FWD
FR-29
F-2 ON REF #2
SH-8
P4AR-4"
ELEV-LKG INBD
ATTACH HGR ASSY 13'-4" OFF ℄ SHIP (P)
SH-7
RH-8
ATTACH HGR ASSY 14'-3" OFF ℄ SHIP (P)
P3C-5"
ELEV-LKG INBD
60'-0" LVL
RH-10
P5AE-5"
SECT LKG FWD
ATTACH HGR ASSY 60" AFT FR 47
FR-44
FR 32
TR-2
ATTACH T.R. & HGR ASSY 14'-5" OFF ℄ SHIP(P)
20 1/2°
P4Q-4"
PLAN VIEW
F-2 ON REF #2
SH-6
TR-2
P4Q-4"
ELEV A-A-LKG INBD
P3-11"
RH-7
SECT-LKG FWD
ATTACH HGR ASSY 14'-11" OFF ℄ SHIP(P)
RH-11
ATTACH HGR ASSY 5" AFT FR 47
P5AD-5"
SECT LKG FWD
RH-9
SH-9
ATTACH HGR ASSY TO FWD BHD 28
P3B-5"
SECT-LKG FWD
SH-11
P5AJ-5"
SECT LKG FWD
ATTACH HGR ASSY 13 1/2" AFT FR 50
INSTALL TR. PERPENDICULAR TO RUN OF PIPE
TR-3
P3AE-5"
F-2 ON REF #2
ELEV-LKG INBD
ATTACH TR. ASSY 21'-0" OFF ℄ (S)
HULL NO. 613C, 614C DWG. NO. 6450-762
SHEET 5 OF


33'-0" LVL
SH-16
P5BA-2 1/2"
SECT-LKG FWD
ATTACH HGR ASSY 6'-6" FWD FR 50
33'-0" LVL
RH-13
P5BA-2 1/2"
SECT-LKG FWD
ATTACH HGR ASSY 24" FWD FR 54
F-2 ON REF #2
SH-18
FOR WELD SEE SK11-A
AFT MATING FLG OF STR.
CONTAM STM GEN FDN
33'-0" LVL
SECT-LKG FWD
F-2 ON REF #2
SH-17
P2AM-6"
CONTAM STM GEN FDN
SECT-LKG FWD
FOR LOCATION SEE REF #1
F-2 ON REF #2
SH-26
FWD MATING FLANGE OF V-101
FOR WELD SEE SK11-A
33'-0" LVL
SECT-LKG FWD
TR-7
P2AM-6"
F-2 ON REF #2
CONTAM STM GEN FDN
33'-0" LVL
SECT-LKG FWD
F-2 ON REF #2
TR-8
P2AM-6"
CONTAM STM GEN FDN
33'-0" LVL
SECT-LKG FWD
OUTBD MATING FLG OF V-141
BHD 58
SH-19
FOR WELD SEE SK11-A
ELEV-LKG OUTBD
BHD 58
TR-9
P3AC-5"
ATTACH T.R. ASSY 10'-4" ABV 33'-0" LVL
PLAN VIEW
ATTACH HGR ASSY 16'-0" OFF ℄ SHIP (S)
BHD 58
F-2 ON REF #2
SH-20
P3AC-5"
ELEV-LKG OUTBD
F-2 ON REF #2
BHD 29
PLAN "A"-"A"
BHD AT FR 44
F-2 ON REF #2
SH-21
INBD MATING FLG FOR V-105
ELEV-LKG OUTBD
P4L-4"
TR-11
33'-5"
SECT-LKG FWD
HULL NO. 613C, 614C DWG. NO. 6450-762
REV. B
SHEET 8 OF

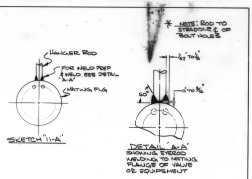

60'-0" LVL
SH-5
MATING FLANGE FOR V-4013
SECTION-LKG FWD
60'-0" LVL
SH-3
6" VENT
P4S-4"
ELEV-LKG OUTBD
INSTALL HGR CLAMP BETWEEN V-4014 & V163
HULL NO. 613C, 614C DWG. NO. 6450-762
SHEET 4 OF


RH-18
F-2 ON REF #2
P5AR-3"
CONTAM STM GEN FDN.
33'-0" LVL
SECT-LKG FWD
ATTACH HGR ASSY 71" OFF ℄ SHIP(S)
BHD 58
F-2 ON REF #2
RH-16
P5AS-3"
ELEV-LKG OUTBD
ATTACH HGR ASSY 12'-0" OFF ℄ SHIP(S)
60'-0" LVL
SH-15
W/W
ATTACH HGR ASSY 36" FWD FR 54
P2AR-6"
SECT-LKG FWD
60'-0" LVL
FR 44
F-2 ON REF #2
SH-27
P3AS-5"
ELEV-LKG INBD
ATTACH HGR ASSY 13' OFF ℄ SHIP(P)
60'-0" LVL
℄ 2-R
F-3 ON REF #2
ATTACH TIE ROD ASSY 68" OFF ℄ SHIP (P)
P3AG-5"
TR-6
10°
SECT "A"-"A"-LKG FWD
F-2 ON REF #2
"A"
TR-6
ELEV-LKG INBD
HULL NO. 613C, 614C DWG. NO. 6450-762
SHEET 7 OF

6450-762

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

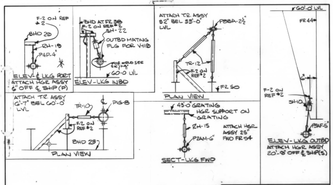
SEPT. '80
FRAME
8X


* NOTE: ROD TO STRADDLE ℄ OF BOLT HOLES
HANGER ROD
FOR WELD PREP & WELD, SEE DETAIL "A-A"
MATING FLG
SKETCH "11-A"
1/32" TO 1/8"
60°
0" TO 3/16"
DETAIL "A-A"
SHOWING EYEROD WELDING TO MATING FLANGE OF VALVE OR EQUIPEMENT

REV. B

HULL NO. 613, 614	DWG. NO. 6450-762
	SHEET 11 OF

MN 47 8½ X 14


F-2 ON REF #2
BHD 23
RH-19
P4P-4"
*
ELEV-℄ LKG PORT
ATTACH HGR ASSY 6" OFF ℄ SHIP (P)
BHD AT FR 38
F-2 ON REF #2
SH-22
OUTBD MATING FLG FOR V419
FOR WELD SEE SK "11-A"
60-0 LVL
ELEV-LKG INBD
ATTACH T.R. ASSY 32" BEL 33'-0" LVL
P8BA-2½"
TR-12
F-2 ON REF #2
FR 50
PLAN VIEW
ATTACH T.R. ASSY 6'-7" BEL 60'-0" LVL
TR-10
℄
P1G-8
F-2 ON REF #2
BHD 23
PLAN VIEW
43'-0" GRATING
HGR SUPPORT ON GRATING
RH-15
P2AM-6"
ATTACH HGR ASSY 25" FWD FR 54
SECT-LKG FWD
60'-0" LVL
FR 44
6"
F-2 ON REF #2
SH-10
P3AF-5"
ELEV-LKG OUTBD
ATTACH HGR ASSY 20'-9" OFF ℄ SHIP (S)

HULL NO. 613C, 614C	DWG. NO. 6450-762
	SHEET 10 OF

MN 47 8½ X 14

6450-762

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

8X

FRAME

6450-763

CSD VAULT
E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING NO
DATE 7-16-76
SIGNED J H Johnson

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS					
REV.	B	B	B	B	
SHEET	1	2	3	4	

DWG. REV. — HULL APPLIC.

REV.	613C	614C
A	YES	YES
B	YES	YES

NNS&DDCo HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C 613C	510 509	T11-S-116A	

APPROVALS
OWNERS NR
ABS NR
USCG NR

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING

SCALE 1/2" & AS NOTED =1 Ft.
DRAWN W.J. GOLIGHTLY
CHECKED JHJ
SECT. MGR. J H Johnson
TECH. APPROVAL NR
DATE COMPL. 7-16-76
EXAMINED
AUTHORIZED E E Stephenson
DATE 7-16-76
CSD APPROVAL R. L. Harrington

HULL 613C

TYPE OF DWG. —

TITLE
PIPE HANGERS-AUXILIARY STEAM-E.R.-FOR ARR DWG 6450-740

DWG. NO. 6450-763 REV B SHEET NO. 1 OF

REVISIONS

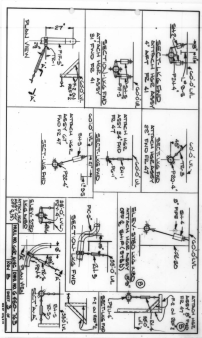
REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	AUTH'D	OWNER DATE	APPD.
A	—	INITIAL ISSUE	7/16/76	JHJ	—	—
B	3, 4	SHT-3; ALT'D LOCATION OF SH-4 & RH-4. SHT-4; ALT'D LOCATION OF RH-2. PIPE NO. FOR SH-7 WAS PIA-5".	6/16/7	JHJ*		

NOTES:

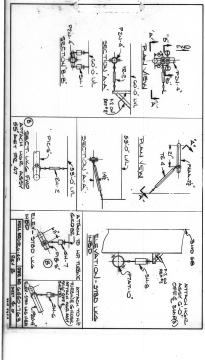
1. FOR KEY PLAN SHOWING LOCATION OF HANGERS IN SHIP, SEE REF # 1.
2. WHERE INDICATED, SUPPORTS, FOUNDATIONS AND REINFORCEMENTS ARE TO BE PROVIDED BY HULL DEPT.
3. HANGERS MAY BE MOVED SLIGHTLY (6" TO EITHER SIDE OF LOCATION SHOWN) TO SUIT CONDITIONS ON SHIP EXCEPT THOSE COVERED BY NOTE # 2.
4. MATERIAL IS GROUPED ON REF # 2.
5. ALL WELDS TO BE 1/4" FILLET.

NO.	REFERENCES	DWG. NO.
2	LIST	6450-741
1	PIPING ARR.-AUXILIARY STEAM-E.R. PLAN, SECT & ELEV	6450-740

HULL NO. 613C, 614C DWG. NO. 6450-763 REV B SHEET 2 OF



SH-2
8" 11 1/2"
60'-0" LVL
L 3x3
P2N-4"
SECT-LKG FWD
ATTACH HGR ASSY 4" AFT FR 41
60'-0" LVL
TR-3
45°
P2Q-4"
SECT-LKG FWD
ATTACH HGR ASSY 22" FWD FR 47
60'-0" LVL
SH-4
3" PIPE
F2-50
ELEV-STBD LKG INBD
ATTACH HGR ASSY 18 3/4" OFF ℄ SHIP (STBD)
ATTACH HGR ASSY 8" FWD FR 47
F-2 ON REF #2
RH-4
33'-0" LVL
P2U-4"
SECT-LKG FWD
60'-0" LVL
SH-3
P1F-5"
SECTION-LKG FWD
ATTACH HGR ASSY 31" FWD FR 41
60'-0" LVL
ATTACH HGR ASSY 34" FWD FR 47
RH-1
P6-1"
SECT-LKG FWD
55'-0" LVL
18"
P1C-5"
RH-3
SECTION-LKG FWD
F-2 ON REF #2
33'-0" LVL
60'-0" LVL
F-2 ON REF #2
27"
P1F-5"
TR-1
2 1/2"
"A"
PLAN VIEW
60'-0" LVL
21"
SH-5
L 3x3
ATTACH HGR ASSY 67" FWD FR 47
P2R-4"
SECT-LKG FWD
33'-0" LVL
P2V-4"
RH-6
ELEV-STBD LKG INBD
ATTACH HGR ASSY 6'-0" OFF ℄ (S)
TR-5
P2V-4"
"A"
PLAN VIEW
RH-5
TR-5
SECT "A-A"
HULL NO. 613C, 614C DWG. NO. 6450-763
REV B SHEET 3 OF

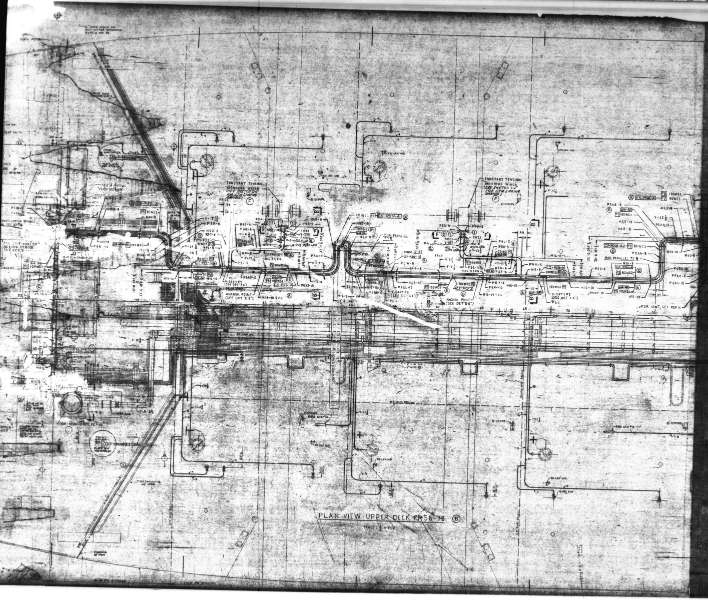


FWD
P2N-4"
"B"
"A"
PLAN VIEW
60'-0" LVL
P2N-4"
TR-2
F-2 ON REF #2
SECTION "A-A"
60'-0" LVL
SH-1
P2N-4"
SECTION "B-B"
"A"
P1AA-2 1/2"
21"
TR-4
PLAN VIEW
33'-0" LVL
14 1/2"
SECTION "A-A"
33'-0" LVL
RH-2
P1C-5"
SECT-LKG FWD
ATTACH HGR ASSY 55" AFT FR 47
BHD 58
ATTACH HGR ASSY 6'-0" OFF ℄ SHIP (S)
F-2 ON REF #2
SH-8
P7AT-10"
ELEVATION-STBD LKG INBD
ATTACH TO H.P. TURBINE GIRDER
SH-7
P1B-5"
ELEV-STBD LKG INBD
ATTACH TO H.P. TURBINE GIRDER. ATTACH HGR ASSY 6'-0" OFF ℄ SHIP (S)
SH-6
P2W-4"
ELEV-STBD LKG INBD
HULL NO. 613C, 614C DWG. NO. 6450-763
REV B SHEET 4 OF

6450-763

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80
FRAME
8X


CONSTANT TENSION MOORING WINCH (SEE SKETCH "L-C" FOR STM ENGINE DRAINS)
ANCHOR POINT (SEE DET "E-E")
ANCHOR POINT (SEE DET "A-A")
RUN PARALLEL
C5-P5V-A
C5-P5U-A
C5-P5AC-A
C5-P5AB-A
C5-P5U-B
100WS1
80WS2
FOR (AMT, SEE REF 11)
ST. BHD BELOW
FIRE STA

PLAN VIEW - UPPER DECK FR 58-73 Ⓑ

SCALE: 1/8 = 1'-0

13. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOW: BUTT WELDS TYPE P-3, SOCKET WELDS TYPE P-34, AND FLANGE WELDS TYPE P-36A OF REFERENCE [illegible] EXCEPT AS OTHERWISE INDICATED.

14. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.

15. ALL HOLECUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.

Ⓑ 16. SYMBOLS CS-P5H-A ETC. INDICATE WELDS REQUIRING NDT AND/OR STRESS RELIEF TO SUIT [illegible] AS LISTED IN REF 14.

Ⓒ 17. BENDING RADII FOR ALL PIPES SHALL BE [illegible] TIMES THE NOMINAL DIAMETER.

Ⓓ 18. ALL U-BOLT HANGERS ARE TO BE INSTALLED WITH A SLIGHT GAP BETWEEN THE TOP OF THE PIPE AND THE BOTTOM OF THE U-BOLT TO PERMIT FREE AXIAL MOVEMENT OF THE PIPE. AFTER THE U-BOLTS ARE SET, THE NUTS ARE TO BE SECURED BY EITHER BEING CENTER PUNCHED OR TACK WELDED. THIS DOES NOT APPLY TO HANGERS AT ANCHOR POINTS.

Ⓔ 19. WELD JOINTS MARKED THUS [illegible] ARE TO BE RADIOGRAPHED FOR HG14C ONLY IN ACCORDANCE WITH REF # 16.

FOR LIST OF MATERIAL SEE REF 9

APPROVALS

OWNER LTR 11679 DTD 10-25-76

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

SCALE AS NOTED
CHECKED D.T. PEDRO
DATE COMP. 9-3-76

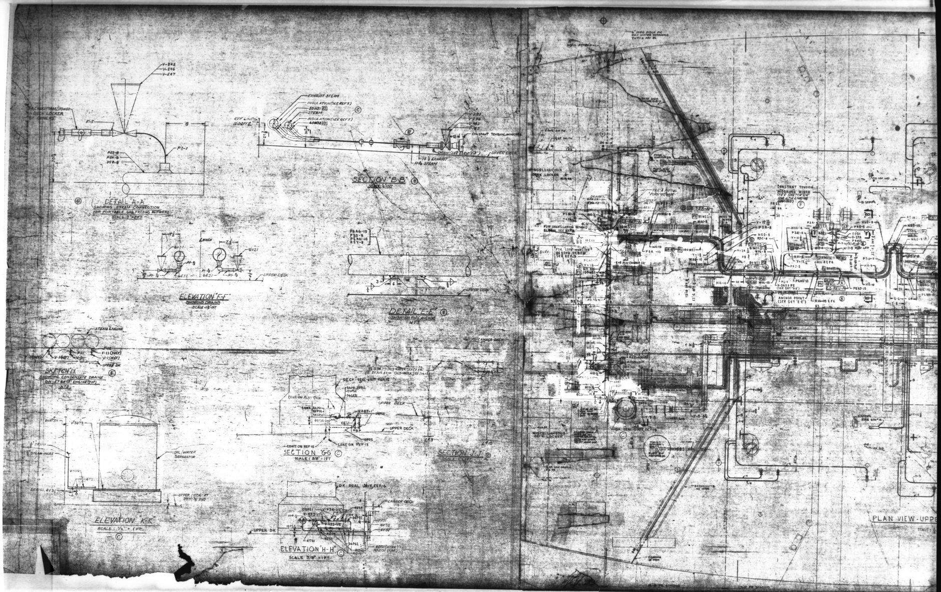
CONTAMINATED STEAM AND EXHAUST PIPING-UPPER DECK FR 58-73 ARD

DWG NO. 6450-773

6450-773

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 1
10X


V-545
V-546
V-547
F.A. CRUCIFORM, STOWED IN DECK LOCKER BY OWNERS
F-5
8
P2-1
P55-8
P54-8
P58-8
10¼
DETAIL "A-A"
SHOWING STEAM CONNECTION FOR PORTABLE GAS FREEING BLOWERS
SCALE 3" = 1 FT.
EXHAUST STEAM
INSULATION (SEE REFS)
50WS1
STEAM
INSULATION (SEE REFS)
40WS2
REF LINE 12-0 OFF ℄
CONSTANT TENSION WINCHES
V-295
V-296
V-162
V-163
12
DRAIN (SEE ELEV "F-F")
UPPER DECK
12½ EXHAUST
11⅛ STEAM
SECTION "B-B"
7½
GVS1
P1-⅜
GES1
UPPER DECK
ELEVATION "F-F"
SHOWING DRAINS
SCALE 1½" = 1 FT
P6AG-10
P55-8
P6AN-10
P54-8
3
6
F-6
DETAIL "E-E"
SHOWING PIPE ANCHOR
N.T.S.
STEAM ENGINE
F-12
F-11
F-11 (N4F)
V-1 (N4F)
V-11 (N4F)
V-1 (N4F)
UPPER DK
SKETCH "L-L"
SHOWING CONDENSATE DRAINS ON STEAM ENGINE (TYP)
N.T.S.
CAMBER DECK
½ STM TO OILY WATER SEP (F&A)
½ DRAIN FROM OILY WATER SEP (F&A)
DECK SEAL UNIT REF 15
CONT ON PLAN VIEW
V487-1"
UPPER DECK
10PS2
CONT ON REF 12
CONT ON REF 13
SECTION "G-G"
SCALE: 3/8" = 1 FT.
SECTION "J-J"
6'-6"
V-5073
½" DRAIN
STEAM INLET
OIL/WATER SEPARATOR
4TS1
DRAINS, 4VS1
UPPER DECK AT 39'-0⅜ FHD
ELEVATION "K-K"
SCALE: ½" = 1 FT.
DK SEAL UNIT REF 15
V-434-1½"
V-433-1½"
V-435-1½"
UPPER DK
4DS1 (NEAR)
10DS1 (FAR)
ELEVATION "H-H"
SCALE 3/8" = 1 FT.
MISCELLANEOUS DECK LOCKER
CONSTANT TENSION MOORING WINCH
ANCHOR POINT (SEE DET "E-E")
PLAN VIEW - UPPE

6450-773

MICRO-MASTER 105 mm
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SEPT. '80
FRAME 2
10X

6450-774

CSD VAULT

E

REPRODUCTION OFFICE YES
YARD PRINTS PARTIAL ISSUE FOR REV "E"
GROUPING YES
DATE 2-13-79
SIGNED L.W. Croswell

YARD PRINTS — ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS																										
REV.	F	C	B	A	B	C	C	F	E	C	F	E	C	B	B	C	C	C	C	C	C	C	C	D	D	D
SHEET	1	2	3	4	5	~~6~~	7	8	9	10	11	12	13	14	15	~~16~~	17	17A	18	19	19A	20	21	5A	5B	5C

REV.	F	D	D	D
SHEET	2A	22	23	24

GROUP SEE GROUP SHEETS
MC NO. —#—#—#—#—

DWG. REV. — HULL APPLIC. (NN HULLS ONLY)	613C	614C
B	Yes	Yes
C	YES	YES
D	YES	YES
E	YES	YES
F	NO	YES

NNSBDDCO HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C	310		
613C	309	LG9-S-94A	

APPROVALS
OWNERS LTR 1167V DTD 10-25-76
ABS LTR DTD 11-30-76
USCG LTR DATED 10-19-76

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division FSCM NO. 43689
DESIGN DIVISION DEPT. COMMERCIAL SHIP ENG.

SCALE NONE
DRAWN RANDY WALTERS
CHECKED D.T. GEDRO
SECT. MGR. L.W. Croswell
DATE COMPL. 9-3-76
EXAMINED —
AUTHORIZED E.E. Stephenson
DATE 9-3-76
TECH. APPROVAL NOT REQD
CSD APPROVAL

HULL 613C

TITLE CONTAMINATED STEAM AND EXHAUST PIPING ARR UPPER DECK FR 58-73 L/M
TYPE OF DWG. WORKING DRAWING
DWG. NO. 6450-774 REV F SHEET NO. 1 OF 24

VECG LTR DTD 12-19-77 ABS LTR DTD 3/6/8

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE	—#—	—#—	—#—	—#—
B	3	ADDED NOTE 4.				
	4	ADDED SHIPOUT INSTRUCTIONS.				
	5	LINE 8: DELETED LINE 10: QTY WAS 1 LINES 14 & 15: ADDED				
	6	DELETED				
	7	LINE 13: PIPE ANCHOR WAS 1/4 X 1 1/2 FB, 3 LG LINE 14: QTY WAS 2.				
	8	LINES 9, 10, 11, 12 & 13: ADDED				
	10	LINE 11: DELETED LINE 13: PIPE ANCHOR WAS 1/4 X 1 1/2 FB, 3 LG				
	11	LINES 7, 8, 9 & 10: ADDED				
	12	LINES 4, 5 & 6 DELETED. LINES 7, 8 & 9 WERE JOINT #①. LINE 9 S/M ALTD.				
	13	LINES 4, 5, 15, & 16: ADDED. LINE 8: QTY WAS 2.				
	14	ALTERED S/M. DELETED SHIPOUT INSTR. ALTERED GROUP NO.				
	15	LINE 8: DELETED. LINES 1 & 2 ALTD S/M LINE 9: QTY WAS 1. LINES 13 & 14: ADDED.				
	16	DELETED				
	17	LINES 2-5, 7 & 8: ALTD. S/M. LINE 11: WAS 1/4 X 1 1/2 FB, 3 LG.				
	17A	ADDED				
	19	LINES 2-5 & 7: ALTD. S/M. LINE 10: DELETED. LINE 10: DELETED. LINE 11: WAS 1/4 X 1 1/2 FB, 3 LG.				
	19A	ADDED				
	20	LINES 4, 5, & 6: DELETED				
	21	LINES 1 & 2: ALTERED S/M LINES 3, 4, 11, & 12: ADDED. LINE 6: QTY WAS 2.				
	ALL	PIPE LENGTH & CONFIGURATION ALT'D TO SUIT REV. B ON REF. 1 RAP JGB				
	5A	ADDED				
	5B	ADDED				
	5C	ADDED JWS				
	9	LINES 4, 5 & 6 WERE JOINT #①. LINE 6 S/M ALTD. JGB				
	5	LINE 9 ADDED JGB JWS				
	7	LINE 12 WAS 1", S/M WAS 216707 S4, L9				
	10					
	13	JWS	10/25/77	RC LWC	3/14/78	LTR 1343V
C	5-21	ADDED SUFFIX PI TO GROUP NOS.	1/14/78	RC LWC		

NO.	REFERENCES	DWG. NO.
4	PAINTING SCHEDULE	8300-40 ⊗ 8300-41 ⊕
3	PIPE DETAILS	6451-457
2		6450-674
1	CONTAMINATED STEAM & EXHAUST SYS UPPER DECK FR 58-73 ARR	6450-773

⊗ 613C & 614C
⊕ 615C

HULL NO. 613C & 614C DWG. NO. 6450-774
REVISION C SHEET 2 OF 24

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D	OWNER DATE	OWNER APPD.
D	5A	LINES 1 & 2: QTY ADDED LINES 3, 6, 7, 8, 10, 13 & 17: DELETED LINE 4: QTY WAS 12". LINE 11: ADDED LINE 15: QTY WAS 1. LINE 16: QTY WAS 2.				
	5B	LINE 1: S/M WAS 25-60-052. LINES 3, 5, 6 & 8: DELETED LINES 2, 10, 11, 12, 14, 15, 16, 17 & 18: ADDED LINE 4: QTY WAS 2.				
	5C	LINES 1 & 2: QTY WAS 8. LINE 3: QTY WAS 2.				
	22 23 24	ADDED MID JGB	4/5/78	RC LWC		
E	8 9 11 12	ADDED L'S 14 & 15 ADDED L'S 7, 8 & 9. (WORK ACCOMP ON 613C) ADDED L'S 11 & 12 ADDED L'S 10, 11 & 12. JGB	1/8/79	RC LWC		
F	8 11	LINES 2, 16 & 17 ADDED LINES 3, 13 & 14 ADDED JWS	2/13/79	RC LWC		

NO.	REFERENCES	DWG. NO.

HULL NO. 613C & 614C DWG. NO. 6450-774
REVISION F SHEET 2A OF 24

NOTES:

1. FOR NOTES, REFERENCES, AND ARRANGEMENT OF PIPING, SEE DWG 6450-773.
2. FOR PIPE DETAILS, SEE DWG 6450-674 & 6451-457.
3. WHERE ASTM-B61 IS USED, CERTIFICATION IS MANDATORY, AND ONE CHEMICAL TEST AND ONE TENSION TEST IS REQUIRED FROM EACH HEAT.
4. Ⓑ ALL PIPE HANGERS TO BE COATED IN ACCORDANCE WITH NOTE 4 ON SHEET 12 OF REF 4.

HULL NO. 613C & 614C DWG. NO. 6450-774
REVISION B SHEET 3 OF 24

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A		1	1	P5N-8	8.625 × .500 THK STL, BLK X-HVY, ASTM-A53, TY S, GR B	PMO 6450-674	PS	
		2						
		3						
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS - SHIP OUT GROUP. SHIP TO HOPEMAN BROTHERS IN CARE OF: CARTERET MFG. CORP. RT. 1162 OFF HWY 101, 6 MILES NORTH OF BEAUFORT, N.C. MOREHEAD CITY, N.C. 28557 P.O. 613C-1340-H1

MC/HO = PS = 160

SERVICE - CONT STEAM SYS FR 58
GROUP NO. 6450-1701-30
APPLICABLE HULLS 613C Yes 614C Yes
DWG NO. 6450-774 SHEET 4 REV. B

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	1	P5P-8	8.625 O.D. × .500 THK, STL, BLK, X-HVY ASTM-A53, TY S GR B	PMO 6450-674	PS	
B	2	2	1	P5R-8				
		3						
		4						
		5						
		6						
		7		FITTING NO.				
B	~~8~~	8	~~1~~	~~F-4~~	~~8 EXPANSION JOINT, STL, FLG'D SING. SLIP, ASTM-A216 OR A515~~	~~6450-C40 ①~~	~~MD-PS~~	
B	9	9	2	F-8	3 1/4 CRUCIFORM W/CAPS	MO 283127 SHT. 4A, L. 8	ST-PS	
B	10	10	2	80WS2	8 BACKING RING, STL, ASTM-A109 FOR 8.625 O.D. × .500 THK PIPE	97-18-138	ST-PS	
		11						
		12						
		13		HANGER NO.				
B	14	14	2	H16-8	PIPE HANGER TY 16 FOR 8" PIPE DWG 257056	MO 2600-135 S-7AF, L-1	ST-PS	
B	15	15	2	H60-8	SPECIAL PIPE HGR FOR 8" PIPE TY 60 DWG 2600-135	MO 2600-135 S-7L, L-1		
		16						
		17						
		18						

REMARKS -

MC/HO: PS = 155

SERVICE - CONT. STEAM SYS FR 58-61
GROUP NO. 6450-0208-1001 PI
APPLICABLE HULLS 613C Yes 614C Yes
DWG NO. 6450-774 SHEET 5 REV. C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D		1	20'-0	10PS2	1.315 O.D. X .179 THK. STL. BLK X-HVY, ASTM-A53, TY S, GR B	K57-07-104	PS	
D		2	112'-0	04PS2	.840 O.D. X .147 THK. STL. BLK X-HVY, ASTM-A53, TY S, GR B	K57-07-102		
D		~~3~~		~~02PS2~~	~~.540 O.D. X .119 THK. STL. BLK X-HVY, ASTM-A53, TYS GR B~~	~~K57-07-100~~		
D		4	6"	20PS2	2.375 OD X .218 THK. STL. BLK X-HVY, ASTM-A53, TY. S, GR. B	57-07-107	ST-PS	
D		5		VALVE NO.				
D		~~6~~	~~1~~	~~V-433~~	~~1/2" GLOBE STOP VALVE BRONZE, SCRD 250# ANSI B16.15 ASTM-B61 OR B62 (SEE NOTE 3)~~	~~26-09-146~~	~~ST-PS~~	
B		~~7~~	~~1~~	~~V-434~~				
D		~~8~~	~~1~~	~~V-435~~				
B		9	1	V-487	1" GLOBE STOP VALVE, C. STL, 600# ANSI B16.5, S.W. ANSI-B16.11, ASTM-A105	P.O. ⑧ 6450-C9	MD-PS	
D		~~10~~	~~1~~	~~V-528~~	~~1/4" GLOBE STOP VALVE, BRONZE 250#, SCRD, ANSI-B16.15, ASTM-B 61 OR 62 (SEE NOTE 3)~~	~~26-09-142~~	~~ST-PS~~	
D		11	1	V-5073	1/2" GLOBE VALVE, 800#, CARB. STL., ASTM-A105, S.W., ANSI-B16.11	P.O. ④ 6450-C9	ST-PS	
		12		FITTING NO.				
D		~~13~~	~~1~~	~~F-7~~	~~3/4" INTEGRAL STRAINER IMPULSE STEAM TRAP~~	~~P.O. ④ 6555-C1~~	MD-PS	
B		14	1	10ES1	1" ELBOW 90° S.W. STL. ASTM-A234, ANSI-B16.11 3000#	25-60-008	ST-PS	
D		15	2	4ES1	1/2" ELBOW 90° SW. STL. ASTM-A234, ANSI-B16.11 3000#	25-60-006		
D		16	1	4TS1	1/2" TEE S.W. STL. 3000# ASTM-A234, ANSI-B16.11	P.O. 608 ① 6450-C21		
D		~~17~~	~~1~~	~~24TRS1~~	~~1/2" X 1/2" X 1/4 TEE SW. STL. ASTM-A234, ANSI-B16.11 3000#~~	~~25-60-210~~		
B		18	1	10CS1	1" COUPLING S.W. STL. 3000# ASTM-A234, ANSI-B16.11	25-60-054		

REMARKS -

PS-MC = 192

SERVICE - CONT. STM SYS. FR 58-61
GROUP NO. 6450-0208-1002 SI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-774 SHEET 5A REV. D

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D		1	6	4CS1	1/2" COUPLING S.W. STL 3000# ASTM-A234, ANSI-B16.11	P.O. 608C ⑧ 2300-C3	ST-PS	
D		2	1	10TS1	1" TEE S.W. STL., 3000#, ASTM-A234, ANSI-B16.11	P.O. 608 ② 6450-C21		
D		~~3~~	~~2~~	~~13BRS1~~	~~3/4" X 1/2" INSERT REDUCER, SW, C.STL ASTM-A234, ANSI-B16.11~~	~~25-60-364~~	~~ST-PS~~	
D		4	1	20JS1	2" FLANGE, SLIP ON, 150#, F.F., ANSI-B16.5 ASTM-A105	25-18-569		
D		~~5~~		~~4US4~~	~~1/2" UNION 3000# FGD. STL S.W. ANSI-B16.11 ASTM-A234~~	~~P.O. ② 6950-C11~~	~~MD-PS~~	
D		~~6~~	~~1~~	~~04DS1~~	~~1/2 BHD SLEEVE, STL., ASTM-A53 GR. B~~	~~25-20-354~~	~~ST-PS~~	
B		7	1	10DS1	1 BHD SLEEVE, STL., ASTM-A53 GR. B	25-20-358		
D		~~8~~	~~1~~	~~34CRS1~~	~~2 × 1/2 RED. COUPLING, SW, 3000#, C. STL, ASTM-A234, ANSI B16.11~~	~~25-60-203~~		
B		9	1	36CRS1	2 × 1 RED. COUPLING, SW, 3000#, C.STL, ASTM-A234, ANSI B16.11	25-60-201		
D		10	1	4DS1	1/2" BHD SLEEVE, STL., ASTM-A53, GR B	25-20-354	ST-PS	
D		11	1	4VS1	1/2" GLOBE VALVE, CARB. STL., 800#, ASTM-A105, S.W., ANSI-B16.11	P.O. ② 6450-C9		
D		12	1	18RS3	1/2 X 1 INSERT RED., STL., 3000#, S.W., ASTM-A234, ANSI-B16.11	25-60-369		
		13		HANGER NO.				
D		14	11	H11-1/2	1/2" SWING HANGER, TYPE H-11, W/1/4 LINER, INOR. ZN. COATED DWG 257056	25-46-326	ST-PS	
D		15	1	H2-1/2	1/2" ANCHOR HANGER, TYPE H2, W/NO LINER, DWG 257056	25-41-322		
D		16	10	H12-1/2	1/2" SWING HANGER, TYPE H12, W/1/4 LINER, INOR. ZN. COATED, DWG 257056	25-47-326		
D		17	3		1/2" SWING HANGER, TYPE H12, (INVERTED), W/1/4 LINER, INOR. ZN. COATED, DWG. 257056			
D		18	3	H12-1"	1" SWING HANGER, TYPE H12, W/1/4 LINER, INOR. ZN. COATED DWG. 257056	25-47-346		

REMARKS -

PS-MC = 192

SERVICE - CONT. STM. SYS. FR 58-61
GROUP NO. 6450-0208-1002 SI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-774 SHEET 5B REV. D

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D	1	4	2022	2"	BOLTS	5/8-11-UNC-2A × 2 1/2" LG, HEX. HD. HVY	P.O. 6000-C7 ⑧	MD-PS	
D	2	4			NUTS	5/8-11-UNC-2B HVY HEX	P.O. 6000-C12 ⑧		
D	3	1			GSKT	1/16 THK COMPRESSED ASBESTOS	15-01-270	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD. HVY ASTM-A307, GR B ZINC PLATED
ALL BOLTS TO BE ANSI B18.2.1
ALL NUTS TO BE ANSI B18.2.2

PS-MC = 192

SERVICE - CONT. STM. SYS. FR. 58-61
GROUP NO. 6450-0208-1002 SI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-774 SHEET 5C REV. D

6450-774

MICRO-MASTER® 105 mm
K+E
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SEPT. '80

FRAME

8X

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
~~A~~	1	~~16~~	~~1208~~	~~8~~	BOLTS	~~HEX HD HVY, ¾-10UNC-2A, 3½ LG~~	~~6000-C7 ⑳~~	~~MD-PS~~	
~~A~~	2	~~16~~			NUTS	~~HEX HVY ¾-10UNC-2B~~	~~6000-C11 ③~~	↓	
~~A~~	3	~~2~~			GSKT	~~COMPRESSED ASBESTOS, 1/16 THK~~	~~15-01-284E~~	~~ST-PS~~	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS – ~~ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B ZINC PLATED~~
~~ALL BOLTS TO BE ANSI STD B18.2.1~~
~~ALL NUTS TO BE ANSI STD B18.2.2~~

SERVICE – ~~CONT. STEAM SYS FR 58-61~~
m/c no: PS=155
GROUP NO. ~~6450-0208-1001 PI~~
APPLICABLE HULLS: 613C Yes, 614C Yes
DWG NO. 6450-774 SHEET 6 REV. C

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	12"	P1-¾	1.050 O.D. × .154 THK, STL, BLK, X-HVY, ASTM-A53, TY S, GR B	K57-07-103	PS	
A	2	2	24"	P2-1	1.315 O.D. × .179 THK, STL, BLK, X-HVY ASTM-A53, TY S, GR B	K57-07-104		
A	3	3	1	P3A-4	4.500 O.D. × .337 THK, STL, BLK, X-HVY, ASTM-A53, TY S, GR B	PMO 6450-674		
B	4	4	1	P3B-4				
B	5	5	1	P3C-4				
B	6	6	1	P5S-8	8.625 O.D. × .500 THK, STL, BLK, X-HVY, ASTM-A53, TY S, GR B			
—		7	—	—				
B	8	8	1	P5U-8				
B	9	9	1	P5V-8	↓	↓	↓	
		10						
		11		FITTING NO.				
B	12	12	1	F-5	¾ HOSE ADAPTER, ASSY BRASS	MO. 283127 S48, L1	ST-PS	
B	13	13	2	F-6	PIPE ANCHOR, ½ × 3 FB, 6 LG ABS, GR A, OR EQUAL	71-30-515	PS	
B	14	14	3	80WS2	8 BACKING RING, STL, ASTM-A109 FOR 8.625 O.D. × .500 THK PIPE	97-18-138	ST-PS	
A	15	15	1	6ES1	¾ ELBOW, 90°, SW, STL, ASTM-A234 ANSI-B16.11, 3000#	25-60-007	↓	
		16		VALVE NO.				
A	17	17	1	V-182	4 GATE VALVE, STL, FLG'D, 150# ASTM-A216, GR WCB	6451-M3 ㊶	MD-PS	
A	18	18	1	V-545	1 GLOBE STOP VALVE, STL, SW, 600#, ASTM-A105 OR A181 GR 1	6450-M9 ⑧	↓	

REMARKS –

SERVICE – CONT STEAM SYS FR 61-65
m/c no: 154
GROUP NO. 6450-0306-1001 PI
APPLICABLE HULLS: 613C Yes, 614C Yes
DWG NO. 6450-774 SHEET 7 REV. C

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	VALVE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	1	6VS1	¾ GLOBE STOP VALVE, SW, STL 600#, ASTM-A105 OR A181, GR 1	6450-C9 ⑥	MD-PS	
F		2	5	V-1	3/8" GATE VALVE SCR'D 125 WSP BRONZE	S/ 26-08-100	ST-PS	
		3						
		4		FITTING NO.				
A	5	5	2	40WS2	4 BACKING RING ASTM-A109 FOR 4.5 × .337 THK PIPE	97-18-106	ST-PS	
		6						
		7						
		8		HANGER NO.				
B	9	9	1	H12-4	4" STD PIPE HANGER TYPE 12 W/O LINER, W/EX LEG INORGANIC ZC COATED	MO 2600-135 S-76, L-6	ST-PS	
B	10	10	2	H60-4	SPECIAL PIPE HGR FOR 4" PIPE TY 60 DWG 2600-135	MO 2600-135 S-7K, L-5		
B	11	11	5	H16-8	PIPE HANGER TY 16 FOR 8" PIPE DWG 257056	MO 2600-135 S-7AF, L-1		
B	12	12	2	H60-8	SPECIAL PIPE HGR FOR 8" PIPE TY 60 DWG 2600-135	MO 2600-135 S-7L, L-1		
B	13	13	2	–	SUPPORT ASSY FOR SPECIAL HGR TYPE H60-4	MO 2600-135 S-7Y, L-5		
E		14	7	F-9	4" Y-STRAINER 300# STL FLG'D	PO ① 6450-C74	ST-PS	
E		15	2	F-10	4" FLG SLIP ON FLG STL 300#	S/ 25-18-518	↓	
F		16	5	F-11	3/8" PIPE NIPPLE EX-HVY STL ASTM-A106 3" LG	S/ 25-14-842	ST-PS	
F		17	2	F-12	1/2 X 3/8 REDUCING BUSHING 150# SCRD MI GALV	S/ 25-05-326	↓	
		18						

REMARKS –

SERVICE – CONT STEAM SYS FR 61-65
m/c no PS=154
GROUP NO. 6450-0306-1001 PI
APPLICABLE HULLS: 613C Yes, 614C Yes
DWG NO. 6450-774 SHEET 8 REV. F

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	16	1204	4	BOLTS	HEX HD HVY, ⅝-11UNC-2A, 3" LG	6000-C7 ㉕	MD-PS	
A	2	16			NUTS	HEX HVY, ⅝-11UNC-2B	6000-C11 ②		
A	3	2			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-278E	ST-PS	
B	4	8	②	4	BOLTS	HEX HD HVY, ¾-10UNC-2A, 2¼ LG	2600-C38 (68)	MD-PS	
B	5	–			NUTS	NOT REQD	—		
B	6	1			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-278 E	ST-PS	
E	7	16	③	4" 300#	BOLTS	¾" BOLT STUD L= 4¾" STL	97-63-051		
E	8	32			NUTS	¾" HVY HEX	21-34-216		
E	9	2			GSKT	1/16" THK Comp. Asbestos	15-01-248	↓	
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS – ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, ZINC PLATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

SERVICE – CONT STEAM SYS FR 61-65
m/c no = PS=154
GROUP NO. 6450-0306-1001 PI
APPLICABLE HULLS: 613C Yes, 614C Yes
DWG NO. 6450-774 SHEET 9 REV. E

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	12"	P1-¾	1.050 O.D. × .154 THK, STL, BLK, X-HVY, ASTM-A53, TY S, GR B	K57-07-103	PS	
A	2	2	24"	P2-1	1.315 O.D. × .179 THK, STL, BLK X-HVY, ASTM-A53, TY S, GR B	K57-07-104		
A	3	3	1	P3D-4	4.500 O.D. × .337 THK, STL, BLK X-HVY, ASTM-A53, TY S, GR B	PMO 6450-674		
A	4	4	1	P3E-4				
A	5	5	1	P3F-4				
B	6	6	1	P5W-8	8.625 O.D. × .500 THK, STL, BLK X-HVY, ASTM-A53, TY S, GR B			
—		7	—	—				
B	8	8	1	P5Y-8	↓	↓	↓	
		9						
		10		FITTING NO.				
B	~~11~~	11	~~1~~	~~F-1~~	~~8 EXPANSION JOINT, STL, FLG'D DOUBLE SLIP, ASTM-A216 OR A319~~	~~6450-C40 ②~~	~~MD-PS~~	
C	12	12	1	F-5	¾ HOSE ADAPTER, ASSY BRASS	MO 283127 S48, L1	ST-PS	
B	13	13	2	F-6	PIPE ANCHOR, ½ × 3 FB, 6 LG ABS, GR A, OR EQUAL	71-30-515	PS	
A	14	14	1	10ES1	¾ ELBOW, 90°, SW, STL, ASTM-A234, ANSI-B16.11, 3000#	25-60-007	ST-PS	
A	15	15	2	80WS2	8 BACKING RING, STL, ASTM-A109, FOR 8.625 O.D. × .500 THK PIPE	97-18-138		
A	16	16	2	40WS2	4 BACKING RING, STL, ASTM-A109 FOR 4.5 O.D. × .337 THK PIPE	97-18-106	↓	
		17		VALVE NO.				
A	18	18	1	V-183	4 GATE VALVE, STL, FLG'D, 150# ASTM-A105 OR A181, GR 1	6451-M3 ㊶	MD-PS	

REMARKS –

SERVICE – CONT STEAM SYS FR 65-69
m/c no PS=153
GROUP NO. 6450-0506-1001 PI
APPLICABLE HULLS: 613C Yes, 614C Yes
DWG NO. 6450-774 SHEET 10 REV. C

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	VALVE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	1	V-546	1 GLOBE STOP VALVE, STL, SW, 600#, ASTM-A105 OR A181, GR 1	6450-C9 ⑧	MD-PS	
A	2	2	1	6VS1	¾ GLOBE STOP VALVE, SW, STL, 600#, ASTM-A105 OR A181, GR 1	6450-C9 ⑥	↓	
F		3	5	V-1	3/8" GATE VALVE SCR'D 125# WSP BRONZE	S/ 26-08-100	ST-PS	
		4						
		5						
		6		HANGER NO				
B	7	7	1	H12-4	4" STD PIPE HGR TYPE 12 W/O LINER, W/EX LEG INORGANIC ZC COATED	MO 2600-135 S-76, L-6	ST-PS	
B	8	8	2	H60-4	SPECIAL PIPE HGR FOR 4" PIPE TY 60 DWG 2600-135	MO 2600-135 S-7K, L-5		
B	9	9	4	H16-8	PIPE HANGER TY 16 FOR 8" PIPE DWG 257056	MO 2600-135 S-7AF, L-1		
B	10	10	2	–	SUPPORT ASSY FOR SPECIAL HGR TYPE H60-4	MO 2600-135 S-7Y, L-5		
E		11	1	F-9	4" Y-STRAINER STL 300# FLG'D	PO ① 6450-C74	ST-PS	
E		12	2	F-10	4" FLG SLIP ON FLG STL 300#	S/ 25-18-518	↓	
F		13	5	F-11	3/8" PIPE NIPPLE EX-HVY STL, ASTM-A106 3" LG	S/ 25-14-842	ST-PS	
F		14	2	F-12	1/2 X 3/8 REDUCING BUSHING 150# SCR'D M.I. GALV	S/ 25-05-326	↓	
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – CONT STEAM SYS FR 65-69
m/c no = PS=153
GROUP NO. 6450-0506-1001 PI
APPLICABLE HULLS: 613C Yes, 614C Yes
DWG NO. 6450-774 SHEET 11 REV. F

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	16	1204	4	BOLTS	HEX HD HVY, ⅝-11UNC-2A, 3" LG	6000-C7 ㉕	MD-PS	
A	2	16			NUTS	HEX HVY, ⅝-11UNC-2B	6000-C11 ②	↓	
A	3	2			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-278E	ST-PS	
B	4	~~16~~	~~1208~~	~~8~~	BOLTS	~~HEX HD HVY, ¾-10UNC-2A, 3½ LG~~	~~6000-C7 ⑳~~	~~MD-PS~~	
B	5	~~16~~			NUTS	~~HEX HD HVY ¾-10UNC-2B~~	~~6000-C11 ③~~	↓	
B	6	~~2~~			GSKT	~~COMPRESSED ASBESTOS, 1/16 THK~~	~~15-01-284E~~	~~ST-PS~~	
B	7	8	②	4	BOLTS	HEX HD HVY ¾-10UNC-2A, 2¼ LG	2600-C38 (68)	MD-PS	
B	8	–			NUTS	NOT REQD	—		
B	9	1			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-278E	ST-PS	
E	10	16	③	4" 300#	BOLTS	¾" Bolt Studs STL L=4¾	97-63-051		
E	11	32			NUTS	¾ HVY HEX STL	21-34-216		
E	12	2			GSKT	1/16" Comp Asbestos	15-01-248	↓	
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS – ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, ZINC PLATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

SERVICE – CONT STEAM SYS FR 65-69
m/c no = PS=153
GROUP NO. 6450-0506-1001 PI
APPLICABLE HULLS: 613C Yes, 614C Yes
DWG NO. 6450-774 SHEET 12 REV. E

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	24"	P2-1	1.315 O.D. × .179 THK, STL, BLK X-HVY, ASTM-A53, TY S, GR B	K57-07-104	PS	
A	2	2	1	P5Z-8	8.625 O.D. × .500 THK, STL, BLK, X-HVY ASTM-A53, TY S, GR B	PMO 6450-674		
B	3	3	1	P5AA-8				
B	4	4	1	P5AB-8				
B	5	5	1	P5AC-8	↓	↓	↓	
		6		FITTING NO.				
B	7	7	1	F-5	¾ HOSE ADAPTER, ASSY BRASS	MO 283127 S-48	ST-PS	
B	8	8	4	80WS2	8 BACKING RING, STL, ASTM-A109, FOR 8.625 O.D. × .500 THK PIPE	97-18-138	↓	
		9						
		10		VALVE NO.				
A	11	11	1	V-547	1 GLOBE STOP VALVE, STL, SW, 600#, ASTM-A105, OR A181, GR 1	6450-C9 ⑧	MD-PS	
		12						
		13						
		14		HANGER NO.				
B	15	15	3	H16-8	PIPE HANGER TY 16 FOR 8" PIPE DWG 257056	MO 2600-135 S-7AF, L-1	ST-PS	
B	16	16	3	H60-8	SPECIAL PIPE HGR FOR 8" PIPE DWG 2600-135	MO 2600-135 S-7L, L-1		
		17						
		18						

REMARKS –

SERVICE – CONT STEAM SYS FR 69-73
m/c no = PS=172
GROUP NO. 6450-0606-1001 PI
APPLICABLE HULLS: 613C Yes, 614C Yes
DWG NO. 6450-774 SHEET 13 REV. C

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	1	P6AC-10	10.750 O.D. × .365 THK, STL, BLK SCH. 40, ASTM-A53, TY S, GR B	PMO 6451-457	PS	
		2						
		3						
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – CONT STEAM EXH SYS FR 58
m/c no = PS=160
GROUP NO. 6451-0208-1001 SI
APPLICABLE HULLS: 613C Yes, 614C Yes
DWG NO. 6450-774 SHEET 14 REV. B

6450-774

MICRO-MASTER® 105 mm
K+E
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ALEXANDRIA • RICHMOND • NORFOLK
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SEPT. '80
FRAME
8X

6450-774

MICRO-MASTER® 105 mm

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SEPT. '80

FRAME

8X

INSTALLATION GROUPS

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	1	P6AD-10	10.750 O.D.×.365 THK, STL, BLK, SCH.40, ASTM-A53, TY S GR B	PMO 6451-457	PS	
B	2	2	1	P6AF-10	↓	↓	↓	
		3						
		4						
		5						
		6						
		7		FITTING NO.				
B	~~8~~	8	~~1~~	~~F-3~~	~~10 EXPANSION JOINT, STL, FLG'D SING. SLIP, ASTM-A216 GR A515~~	~~6450-C40 ③~~	~~MD-PS~~	
B	9	9	2	100WS1	10 BACKING RING, STL, ASTM-A109 FOR 10.750 O.D.×.365 THK PIPE	97-18-141	ST-PS	
		10						
		11						
		12		HANGER NO				
B	13	13	2	H16-10	PIPE HANGER TY 16 FOR 10" PIPE DWG 257056	MO 2600-135 S-7AF, L-5	ST-PS	
B	14	14	2	H60-10	SPECIAL PIPE HGR FOR 10" PIPE TY 60 DWG 2600-135	MO 2600-135 S-7L, L-5		
		15						
		16						
		17						
		18						

REMARKS -

MC NO = PS=155

SERVICE - CONT STEAM EXH SYS FR 58-61

GROUP NO. 6451-0208-1001 SI

APPLICABLE HULLS: 613C Yes; 614C Yes

DWG NO. 6450-774 SHEET 15 REV. B

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	24	100Z1	10	BOLTS	HEX HD HVY, 7/8-9UNC-2A-3 3/4 LG	6000-C7 ⑮	MD-PS	
A	2	24			NUTS	HEX HVY, 7/8-9UNC-2B	6000-C11 ④	↓	
A	3	2			GSKT	COMPRESSED ASBESTOS 1/16 THK	15-01-286E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, ZINC PLATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

MC NO = PS=155

SERVICE - CONT STEAM EXH SYS FR 58-61

GROUP NO. 6451-0208-1001 PI

APPLICABLE HULLS: 613C Yes; 614C Yes

DWG NO. 6450-774 SHEET 16 REV. C

INSTALLATION GROUPS

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	12"	P1-3/4	1.050 O.D.×.113 THK, STL, BLK, SCH.40, ASTM-A53, TY S, GR B	57-06-103	PS	
B	2	2	1	P4G-5	5.563 O.D.×.258 THK, STL, BLK, SCH.40, ASTM-A53, TY S, GR B	PMO 6451-457	↓	
B	3	3	1	P4H-5	↓	↓		
B	4	4	1	P4J-5				
B	5	5	1	P6AG-10	10.750 O.D.×.365 THK, STL, BLK, SCH.40, ASTM-A53, TY S, GR B			
—		6	—	—	↓			
B	7	7	1	P6AJ-10				
B	8	8	1	P6AK10				
		9						
		10		FITTING NO.				
B	11	11	2	F-6	PIPE ANCHOR, 1/2 × 3 FB, 6 LG ABS OR EQUAL	71-30-515	PS	
A	12	12	3	100WS1	10 BACKING RING, STL, ASTM-A109, FOR 10.750 O.D.×.365 THK PIPE	97-18-141	ST-PS	
A	13	13	1	6ES1	3/4 ELBOW 90°, SW, STL, ASTM-A234 ANSI-B16.11, 3000#	25-60-007	↓	
A	14	14	2	50WS1	5 BACKING RING STL ASTM-A109 FOR 5.563 × .258 THK PIPE	97-18-133		
		15		VALVE NO.				
A	16	16	1	V-296	5 GATE VALVE, STL, FLG'D, 150#, ASTM-A216, GR WCB	6451-M3 ㉔	MD-PS	
A	17	17	1	6VS1	3/4 GLOBE STOP VALVE, SW, STL, 600#, ASTM-A105 OR A181, GR 1	6450-C9 ⑥	↓	
		18						

REMARKS -

MC NO = PS=154

SERVICE - CONT STEAM EXH SYS FR 61-65

GROUP NO. 6451-0306-1001 PI

APPLICABLE HULLS: 613C Yes; 614C Yes

DWG NO. 6450-774 SHEET 17 REV. C

INSTALLATION GROUPS

REV.		LINE NO.	QTY (1 SHIP)	HANGER NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	5	H16-10	PIPE HANGER TY16 FOR 10" PIPE DWG 257056	MO 2600-135 S-7AF, L-5	ST-PS	
B	2	2	1	H60-10	SPECIAL PIPE HGR FOR 10" PIPE TY 60 DWG 2600-135	MO 2600-135 S-7L, L-5		
B	3	3	1	H12-5	5" STD PIPE HGR TYPE 12 W/O LINER, W/EXTRA LEG INORGANIC ZC COATED	MO 2600-135 S-7G, L-11		
B	4	4	2	H60-5	SPECIAL PIPE HGR FOR 5" PIPE TY 60 DWG 2600-135	MO 2600-135 S-7K, L-9		
B	5	5	2	—	SUPPORT ASSY FOR SPECIAL HGR TYPE H60-5	MO 2600-135 S-7Y, L-9		
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - CONT STEAM EXH SYS FR 61-65

GROUP NO. 6451-0306-1001 PI

APPLICABLE HULLS: 613C YES; 614C YES

DWG NO. 6450-774 SHEET 17A REV. C

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	16	50Z1	5	BOLTS	HEX HD HVY, 3/4-10UNC-2A, 3" LG	6000-C7 ㉒	MD-PS	
A	2	16			NUTS	HEX HVY, 3/4-10UNC-2B	6000-C11 ③	↓	
A	3	2			GSKT	COMPRESSED ASBESTOS 1/16 THK	15-01-280E	ST-PS	
A	4	8	①	6	BOLTS	HEX HD HVY, 3/4-10UNC-2A, 2 1/4 LG	2600-C38 (68)	MD-PS	
A	5	—			NUTS	NOT REQD			
A	6	1			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-282E	ST-PS	
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, ZINC PLATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

MC NO = PS=154

SERVICE - CONT. STEAM EXH SYS FR 61-65

GROUP NO. 6451-0306-1001 PI

APPLICABLE HULLS: 613C Yes; 614C Yes

DWG NO. 6450-774 SHEET 18 REV. C

INSTALLATION GROUPS

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	12"	P1-3/4	1.050 O.D.×.113 THK, STL, BLK, SCH.40, ASTM-A53, TY S, GR B	57-06-103	PS	
B	2	2	1	P4K-5	5.563 O.D.×.258 THK, STL, BLK, SCH.40, ASTM-A53, TY S, GR B	PMO 6451-457	↓	
B	3	3	1	P4L-5	↓	↓		
B	4	4	1	P4M-5				
B	5	5	1	P6AL-10	10.750 O.D.×.365 THK, STL, BLK, SCH.40, ASTM-A53, TY S, GR B			
—	—	6	—	—	↓			
B	7	7	1	P6AN-10				
		8						
		9		FITTING NO.				
B	~~10~~	10	~~1~~	~~F-2~~	~~10 EXPANSION JOINT, STL, FLG'D DOUBLE SLIP, ASTM-A216 GR A515~~	~~6450-C40 ④~~	~~MD-PS~~	
B	11	11	2	F-6	PIPE ANCHOR, 1/2 × 3 FB, 6 LG ABS, GR A, OR EQUAL.	71-30-515	PS	
A	12	12	1	6ES1	3/4 ELBOW, 90°, SW, STL, ASTM-A234, ANSI-B16.11, 3000#	25-60-007	ST-PS	
A	13	13	2	100WS1	10 BACKING RING, STL, ASTM-A109, FOR 10.750×.365 THK PIPE	97-18-141	↓	
A	14	14	2	50WS1	5 BACKING RING, STL, ASTM-A109, FOR 5.563 × .258 THK PIPE	97-18-133		
		15		VALVE NO.				
A	16	16	1	V-293	5 GATE VALVE, STL, FLG'D, 150#, ASTM-A216, GR WCB	6451-M3 ㉔	MD-PS	
A	17	17	1	6VS1	3/4 GLOB STOP VALVE, STL, SW, 600# ASTM-A105 OR A181, GR 1	6450-C9 ⑥	↓	
		18						

REMARKS -

MC NO = PS=153

SERVICE - CONT STEAM EXH SYS FR 65-69

GROUP NO. 6451-0506-1001 PI

APPLICABLE HULLS: 613C Yes; 614C Yes

DWG NO. 6450-774 SHEET 19 REV. C

INSTALLATION GROUPS

REV.		LINE NO.	QTY (1 SHIP)	HANGER NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	4	H16-10	PIPE HANGER TY16 FOR 10" PIPE DWG 257056	MO 2600-135 S-7AF, L-5	ST-PS	
B	2	2	1	H12-5	5" STD PIPE HGR TYPE 12 W/O LINER, W/EXTRA LEG INORGANIC ZC COATED	MO 2600-135 S-7G, L-11		
B	3	3	2	H60-5	SPECIAL PIPE HGR FOR 5" PIPE TYPE 60 DWG 2600-135	MO 2600-135 S-7K, L-9		
B	4	4	2	—	SUPPORT ASSY FOR SPECIAL HANGER TYPE H60-5	MO 2600-135 S-7Y, L-9		
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - CONT STEAM EXH SYS FR65-69

GROUP NO. 6451-0506-1001 PI

APPLICABLE HULLS: 613C YES; 614C YES

DWG NO. 6450-774 SHEET 19A REV. C

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	16	50Z1	5	BOLTS	HEX HD HVY, 3/4-10UNC-2A, 3" LG	6000-C7 ㉒	MD-PS	
A	2	16			NUTS	HEX HVY, 3/4-10UNC-2B	6000-C11 ③	↓	
A	3	2			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-280E	ST-PS	
B	~~4~~	~~24~~	~~100Z1~~	~~10~~	~~BOLTS~~	~~HEX HD HVY, 7/8-9UNC-2A, 3 3/4 LG~~	~~6000-C7 ⑮~~	~~MD-PS~~	
B	~~5~~	~~24~~			~~NUTS~~	~~HEX HVY, 7/8-9UNC-2B~~	~~6000-C11 ④~~		
B	~~6~~	~~2~~			~~GSKT~~	~~COMPRESSED ASBESTOS 1/16 THK~~	~~15-01-286E~~	~~ST-PS~~	
A	7	8	①	6	BOLTS	HEX HD HVY 3/4-10UNC-2A, 2 1/4 LG	2600-C38 (68)	MD-PS	
A	8	—			NUTS	NOT REQD	—		
A	9	1			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-282E	ST-PS	
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, ZINC PLATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

MC NO = PS=153

SERVICE - CONT STEAM EXH SYS FR 65-69

GROUP NO. 6451-0506-1001 PI

APPLICABLE HULLS: 613C Yes; 614C Yes

DWG NO. 6450-774 SHEET 20 REV. C

INSTALLATION GROUPS

NN 3569

REV.	LINE	ITEM NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	1	P6AP-10	10.750 O.D.×.365 THK, STL, BLK SCH.40, ASTM-A53, TY S, GR B	PMO 6451-457	PS	
B	2	2	1	P6AQ-10	↓	↓	↓	
B	3	3	1	P6AR-10				
B	4	4	1	P6AS-10				
		5		FITTING NO.				
B	6	6	4	100WS1	10 BACKING RING, STL, ASTM-A109, FOR 10.750 O.D.×.365 THK PIPE	97-18-141	ST-PS	
		7						
		8						
		9						
		10		HANGER NO				
B	11	11	3	H16-10	PIPE HANGER TY16 FOR 10" PIPE DWG 257056	MO 2600-135 S-7AF, L-5	ST-PS	
B	12	12	3	H60-10	SPECIAL PIPE HGR TY 60 FOR 10" PIPE DWG 2600-135	MO 2600-135 S-7L, L-5		
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

MC NO = PS=172

SERVICE - CONT STEAM EXH SYS FR69-73

GROUP NO. 6451-0606-1001 PI

APPLICABLE HULLS: 613C Yes; 614C Yes

DWG NO. 6450-774 SHEET 21 REV. C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D		1	6"	20PS2	2.375 O.D. x.218 THK, STL., BLK, X-HVY, ASTM-A53, TY S, GR B	57-07-107	ST-PS	
D		2	135'-0	4PS2	.840 O.D. x.147 THK, STL, BLK, X-HVY, ASTM-A53, TY S, GR B	57-07-102		
D		3	36"	2PS2	.540 O.D. x.119 THK, STL, BLK, X-HVY, ASTM-A53, TY S, GR B	57-07-100		
		4						
		5						
		6						
		7		FITTING NO.				
D		8	2	4ESI	1/2" ELL, 90°, S.W., STL., 3000# ASTM-A234, ANSI-B16.11	25-60-006	ST-PS	
D		9	3	4TSI	1/2" TEE, S.W., STL., 3000# ASTM-A234, ANSI-B16.11	P.O. 608 ① 6450-C21		
D		10	1	V-528	1/4 GLOBE STOP VALVE, BRONZE, 250# SCR'D, ANSI-B16.15, ASTM-B61 OR 62 (SEE NOTE 3)	26-09-142		
D		11	1	V-433	1/2" GLOBE STOP VALVE, BRZ, SCR'D, 250#, ANSI-B16.15, ASTM-B61 OR 62 (SEE NOTE 3)	26-09-146		
D		12	1	V-434				
D		13	1	V-435				
D		14	1	24TRSI	1/2 x 1/2 x 1/4 TEE S.W., STL., ASTM-A234, ANSI-B16.11, 3000#	25-60-219		
D		15	1	F-7	3/4" INTEGRAL STRAINER IMPULSE STEAM TRAP	P.O. ① 6555-C1		
D		16	2	13BRSI	3/4 x 1/2 INSERT REDUCER, S.W., C.STL., ASTM-A234, ANSI-B16.11	25-60-364		
D		17	1	20JSI	2" FLANGE, SLIP-ON, 150#, F.F., ANSI-B16.5, ASTM-A105	25-18-569		
D		18	3	4US4	1/2 UNION, 3000#, FGD. STL., S.W., ANSI-B16.11, ASTM-A234	P.O. ② 6950-C11		

REMARKS -

SERVICE - CONT STEAM DRAIN FR 58-61

PS-MC=192

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0208-1001-SI		
	YES	YES	DRG NO. 6450-774	SHEET 22	REV. D	

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D		1	1	4DSI	1/2 BHD SLEEVE, STL ASTM-A53, GR B	25-20-354	ST-PS	
D		2	1	34CRSI	2 x 1/2 RED. COUPLING, S.W., 3000#, C.STL., ASTM-A234, ANSI-B16.11	25-60-203		
D		3	1	V-5074	1/2" GLOBE STOP VALVE, 800# CAR. STL, ASTM-A105, S.W., ANSI-B16.11	P.O. ④ 6450-C9		
D		4	1	4VSI	1/2" GLOBE VALVE, CARB. STL., 800#, ASTM-A105, SW., ANSI-B16.11	P.O. ② 6450-C9		
D		5	6	4CSI	1/2" COUPLING, S.W., STL., 3000# ASTM-A234, ANSI-B16.11	P.O. 608C 2300-C3 ⑧		
		6						
		7						
		8						
		9						
		10						
		11		HANGER NO.				
D		12	3	H14-1/2"	1/2" SWING HANGER, TYPE H14 W/ 1/4 LINER, INOR. ZN. COATED, DWG 257056	25-49-326	ST-PS	
D		13	10	H12-1/2"	1/2 SWING HANGER, TYPE H12 W/ 1/4 LINER, INOR. ZN. COATED, DWG 257056	25-47-326		
D		14	6	H12-1/2"	1/2" SWING HANGER, TYPE H12, (INVERTED), 1/4 LINER, INOR. ZN. COATED, DWG 257056			
D		15	11	H11-1/2"	1/2" SWING HANGER, TYPE H-11 W/ 1/4 LINER, INOR. ZN. COATED, DWG. 257056	25-46-326		
D		16	1	H2-1/2"	1/2" ANCHOR HANGER, TYPE H-2 W/NO LINER, DWG 257056	25-41-322		
		17						
		18						

REMARKS -

SERVICE - CONT STEAM DRAIN FR 58-61

PS-MC=192

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0208-1001-SI		
	YES	YES	DRG NO. 6450-774	SHEET 23	REV. D	

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D	1	4	2022	2"	BOLTS	5/8-11UNC-2A x 2 1/2 LG. HEX HD HW	P.O. 6000-C7 ㉑	ST-PS	
D	2	4			NUTS	5/8-11UNC-2B HVY HEX	P.O. 6000-C12 ⑱		
D	3	1			GSKT	1/16 COMPRESSED ASBESTOS	15-01-270		
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD. HVY ASTM-A307, GR B, ZINC PLATED
ALL BOLTS TO BE ANSI B18.2.1
ALL NUTS TO BE ANSI B18.2.2

SERVICE - CONT STEAM DRAIN FR 58-61

PS-MC=192

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0208-1001-SI		
	YES	YES	DRG NO. 6450-774	SHEET 24	REV. D	

6450-774

MICRO-MASTER® 105 mm
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FRAME
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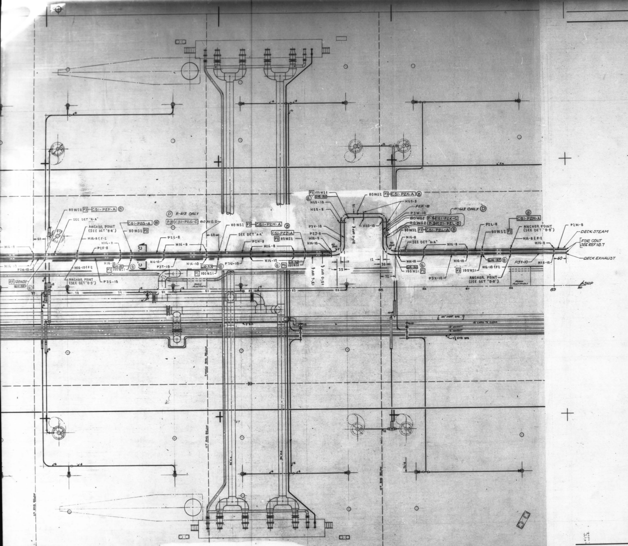


PLAN VIEW-UPPER LEVEL FR73-89 Ⓑ

SCALE: 3/8" = 1 FT

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHD	OWNER DATE	OWNER APPD
A.	ALL	INITIAL ISSUE				
B	ALL	DESIGN DEVELOPMENT: DELETED EXPANSION LOOP IN PIPES P2 & P3 AT FR 76 1/2 AND ADDED EXPANSION LOOP AT FR 84-85. ADDED PIPE HANGERS ON PIPES P2 & P3. INCREASED SIZE OF F-2 SHOWN ON DETAIL "B-B". DELETED NOTE 10 & REF 5. SECTION "C-C"-DELETED PIPE INSULATION & ALTERED DIMENSION ABOVE UPPER DECK. RAD JGB NOTE 12: EXHAUST WAS CLASS II. ADDED WELD JOINT NOS., REF 12 & NOTE 16. JCB JGB IN DETAIL "A-A" 1" CRUCIFORM INDICATED JGB JWS	10/26/77		3-14-78	LTR 1943V
C	ALL	ADDED INSULATION ON SEC. "C-C" REINSTATED NOTE 10 & REF. 5 AND ALL TO SUIT REF. 5. JGB	3/13/78			
D	–	ADDED WELD JOINT No. CSI-P2G-C TO SUIT YARD REQUEST APPLICABLE TO H-613C ONLY. JWS ADDED NOTE 17. THIS INCORPORATES LAR LWC-NO.48. ADDED WELD JOINT Nos. CSI-P2K-C & CSI-P2L-D TO SUIT YARD REQUEST FOR A FLANGED TEST CONNECTION THIS INCORPORATES LIAISON LWC-No.36 APPLICABLE TO H-613C ONY. JGB JWS	10/24/78			
E		ADDED ADDITIONAL WELD INDEX NUMBERS FOR 614C ONLY ADDED NOTE # 18 + REF # 13. JGB	1/8/79			

USCG DTD 12/19/77
ABS DTD 3/6/78

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCES 1 AND 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REFERENCE 1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. AND REFERENCE 3.
4. BACKING RINGS AND COUPLINGS SHOWN IN LIST OF MAT'L ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMP AND ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REFERENCE 6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REFERENCE 1.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REFERENCE 4.
10. Ⓒ Ⓑ INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REFERENCE 5.
11. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
12. Ⓑ ALL DECK STEAM PIPING ON THIS DRAWING IS CLASS I, ALL DECK EXHAUST PIPING ON THIS DRAWING IS CLASS I.
13. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOW: BUTT WELDS TYPE P-3, SOCKET WELDS TYPE P-14, AND FLANGE WELDS TYPE P-16A ON REFERENCE 3 EXCEPT AS OTHERWISE INDICATED.
14. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
15. ALL HOLECUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.
16. Ⓑ SYMBOLS CSI-P2A-A ETC. INDICATE WELDS REQUIRING NDT AND/OR STRESS RELIEF TO SUIT REF. 3 & AS LISTED ON REF. 12.
17. Ⓓ ALL "U" BOLT HANGERS ARE TO BE INSTALLED WITH A SLIGHT GAP BETWEEN THE TOP OF THE PIPE AND THE BOTTOM OF THE "U" BOLT TO PERMIT FREE AXIAL MOVEMENT OF THE PIPE. AFTER THE "U" BOLTS ARE SET, THE NUTS ARE TO BE SECURED BY EITHER BEING CENTER PUNCHED OR TACK WELDED. THIS DOES NOT APPLY TO HANGERS AT ANCHOR POINTS.
18. Ⓔ WELD JOINTS MARKED THUS 614- ARE TO BE RADIOGRAPHED FOR H614C ONLY IN ACCORDANCE WITH REF # 13.

FOR LIST OF MATERIAL SEE REF 9

REVISION APPLICABILITY		
REV	N.N. HULL NO. 613C	N.N. HULL NO. 614C
A	YES	YES
B	YES	YES
C	YES	YES
D	YES	NO
E	NO	YES

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING —
REMARKS REV "E"
DATE 1-8-79 SIGNED L.W. Cresswell

NO.	REFERENCES	DWG NO.
Ⓔ 13	WELD INDEX TABULATION FOR MISC PIPING SYS (614C ONLY)	285301
Ⓑ 12	WELD INDEX-CONT. STM-UP DK-FR 73-89	6450-836
11	CONT EXHAUST PIPING ARR UPPER DK FR 73-89 PIPE DET	6451-438
10	CONT STEAM & EXH PIPING ARR UPPER DK FR 58-73	6450-773
9	CONT STEM & EXH PIPING ARR UPPER DK FR 73-89 L/M	6450-776
8	CONT STEAM PIPING ARR UPPER DK FR 73-89 PIPE DET	6450-675
7	CONT STM & EXH PIPING ARR UPPER DK FR 89-105	6450-777
6	PAINTING SCHEDULE	8300-40 ● 8300-41 ▲
Ⓒ Ⓑ 5	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
4	TYPICAL ARRANGEMENT OF GAGE PIPING	6750-481
3	FABRICATION & WELDING INSTRUCTIONS-CL 1 & 11 PIPING	257035
2	↑ ↑ ↑ ↑ ↑ ARR	6450-692
1	DIAGRAM- CONT STEAM GEN SYS -LIST	6450-693

● HULLS 613C & 614C
▲ HULL 615C ONLY

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS
OWNERS LTR 1430V DTD 8-11-77
ABS LTR DTD 3-6-78
USCG LTR DTD 4-4-77

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

6450-0706-1001 6451-0706-1001
6450-0806-1001 6451-0806-1001
6450-0906-1001 6451-0906-1001
6450-1006-1001 6451-1006-1001

SCALE 3/8" & AS NOTED = 1 FT
DRAWN Randy Walters
CHECKED E.W. Kelly
SECT MGR L.W. Cresswell
DATE COMPL. 1-14-77
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 1-14-77
TECH APPROVAL NOT REQ'D
CSD APPROVAL for R.L. HARRINGTON

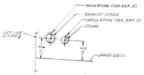
CONTAMINATED STEAM AND EXHAUST PIPING-UPPER DECK FR 73-89 ARR

USMA DESIGN 111-S-118a
USMA DWG NO.
HULL NO.
DWG NO. 6450-775
REV E
SHEET NO. 1 OF 1

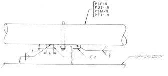
GROUP:
MC NO.

6450-775

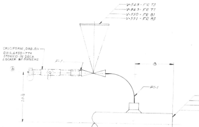
SEPT. '80
FRAME 1
10X


INSULATION (SEE REF 5)
EXHAUST STEAM
INSULATION (SEE REF 5)
STEAM
REF LINE 12'0 OFF ℄
25 3/8
24 5/16
UPPER DECK

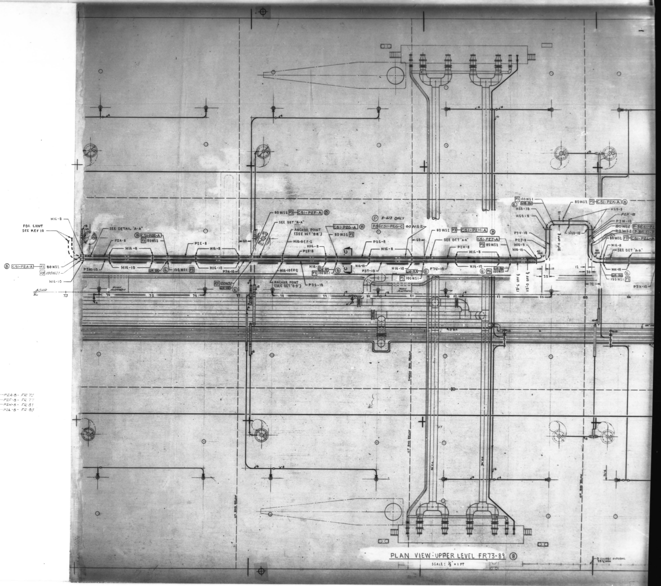
SECTION "C-C" Ⓑ©
SCALE: 1/2"=1FT


P2F-8
P3S-10
P2M-8
P3Y-10
3
6
1/8
F-2
UPPER DECK

DETAIL "B-B" Ⓑ
SHOWING PIPE ANCHOR
NTS


V-548 - FR 73
V-549 - FR 77
V-550 - FR 81
V-551 - FR 85
CRUCIFORM, ORD. ON DWG. 6450-774 STOWED IN DECK LOCKER BY OWNERS
Ⓑ
F-1
8
P1-1
10 1/2
P2A-8 - FR 73
P2F-8 - FR 77
P2H-8 - FR 81
P2L-8 - FR 85

DETAIL "A-A"
SHOWING STEAM CONN FOR PORTABLE GAS FREEING BLOWERS
SCALE: 3"=1FT


FOR CONT SEE REF 10
H16-8
SEE DETAIL "A-A"
Ⓑ CSI-P2A-A
P3 80WS2
P3 100WS1
H16-10
P2A-8
P3M-10
Ⓑ CSI-P2E-A
P3 80WS2
H16-8
H16-10
G14-BA
Ⓔ
100WS1 P3
P2E-8
P3N-10
P3 100WS1
G14-AY
80WS2 P3 CSI-P2F-A Ⓑ
SEE DET "A-A"
ANCHOR POINT (SEE DET "B-B")
H16-8 & F-2
H16-10 & F-2
P2F-8
P3S-10
CSI-P2G-A Ⓑ
80WS2 P3
Ⓓ H-613 ONLY
P3 CSI-P2G-C 80WS2
P2G-8
P3T-10
G14-AW
P3 100WS1
80WS2 P3 CSI-P2H-A Ⓑ
SEE DET "A-A"
P2H-8
P3U-10
G14-AX
CSI-P2J-A
P3 80WS2
P2J-8
P3V-10
G14-AV
P3 100WS1
H60-10
H60-8
80WS2 P3 CSI-P2K-A Ⓑ
P2K-8
P3W-10
80WS2 P-3 CSI-P2
80WS2 P3 CSI-P2L-A
SEE DET "A-A"
G14-AU
100WS1 P3
P3X-10
60
30'-6 OFF ℄
13'-6 OFF ℄
15'-0 OFF ℄
18
17
35
12
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72
SHIP
73
74
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76
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83
84
85
86
3 COURSE PIPERAIL

PLAN VIEW - UPPER LEVEL FR73-89 Ⓑ
SCALE: 1/8" = 1 FT

6450-775

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80
10X
FRAME 2

6450.776

CSD VAULT
E

REPRODUCTION OFFICE	
YARD PRINTS	YES
REMARKS	REV "B"
GROUPING	YES
DATE	10-25-77
SIGNED	L.W. Creswell

YARD PRINTS — ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS	REV.	B	B	B	B	B	B	B	B	B	B	B
	SHEET	1	2	3	4	5	6	7	8	9	10	11

GROUP SEE GROUP SHEETS
MC NO. —#—#—#—#—#

DWG. REV. — HULL APPLIC.	NN HULLS ONLY	
REV.	613C	614C
A	Yes	Yes
B	Yes	Yes

NNS&DDCo. HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C	310		
613C	309		

APPROVALS
OWNERS LTR 1490V DTD 3-11-77
ABS LTR DTD 3/6/78
USCG LTR DTD 4-4-77

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING

SCALE NONE =1 Ft.
DRAWN Randy Walters
CHECKED E.W. Kelly
SECT. MGR. L.W. Creswell
DATE COMPL. 1-14-77
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 1-14-77
TECH. APPROVAL NOT REQD
CSD APPROVAL EEN for R.L. HARRINGTON

HULL 613C
GROUPED / DATES — KEY, GROUP NO., PART, COMP., BY, CHK.

TITLE CONTAMINATED STEAM AND EXHAUST PIPING ARR UPPER DECK FR 73-89 L/M

TYPE OF DWG. WORKING DRAWING
DWG. NO. 6450-776
REV B
SHEET NO. 1 OF 11

USCG LTR 12-19-77

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE	#	#	#	#
B	4	LINES 2, 3, & 4: DELETED LINE 12: QTY WAS 5 LINE 16: ADDED				
	5	LINES 15 & 18: ADDED				
	6	LINES 4, 13, & 14: ADDED LINE 9: DELETED LINE 10: QTY WAS 2				
	7	LINES 1 & 2: PIPE NO WAS P2K-8 & P2L-8 LINES 5 & 16: ADDED. LINE 15: QTY. WAS 2.				
	8	LINES 3, 4, & 5: DELETED. LINE 9: QTY WAS 5 LINE 16: ADDED				
	9	LINES 10 & 15: ADDED.				
	10	LINES 3, 15 & 16: ADDED. LINE 9: QTY WAS 2. LINE 10: DELETED.				
	11	LINES 1 & 2: PIPE NOS. WERE P3W-10 & P3X-10. LINE 9: QTY WAS 2. LINES 10 & 13: ADDED.				
	2	ADDED REF 4.				
	3	ADDED NOTE 4.				
	ALL	PIPE LENGTHS & CONFIGURATION ALTERED TO SUIT REV. B ON REF. 1 JGB				
	4 5 6 7	LINE 11 - ALT. DESCRIPTION COLUMN 13 11 14 TMF				
	4 5 6 7	LINE 11 - WAS 1", S/M WAS MO 216707 S4, L9 13 11 14 JG	10/25/77	LWC	3-14-8	SHELL LTR 1943V

NO.	REFERENCES	DWG. NO.
4	PAINTING SCHEDULE	8300-40 ⊗ 8300-41 ⊕
3	CONT STEAM PIPING ARR UPPER DK FR 73-89 PIPE DET	6450-675
2	CONT EXAUST PIPING ARR UPPER DK FR 73-89 PIPE DET	6451-458
1	CONT STM & EXH SYS UPPER DECK FR 73-89 ARR	6450-775

⊗ 613C & 614C
⊕ 615C

HULL NO. 613C & 614C DWG. NO. 6450-776
REVISION B SHEET 2 OF 11

NOTES:

1. FOR NOTES, REFERENCES, AND ARRANGEMENT OF PIPING, SEE REFERENCE NO. 1.
2. FOR PIPE DETAILS SEE REFERENCE NO. 2 & 3.
3. WHERE ASTM-B61 IS USED, CERTIFICATION IS MANDATORY, AND ONE CHEMICAL TEST AND ONE TENSION TEST IS REQUIRED FROM EACH HEAT.
4. ALL PIPE HANGERS TO BE COATED IN ACCORDANCE WITH NOTE 4 ON SHEET 12 OF REF. 4.

HULL NO. 613C, 614C DWG. NO. 6450-776
REVISION B SHEET 3 OF 11

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	P2A-8	8.625OD×.500 THK STL, BLK, X-HVY, ASTM-A53, TY S, GR B	PMO 6450-675	PS	
B	~~2~~	~~1~~	~~P2B-8~~				
B	~~3~~	~~1~~	~~P2C-8~~				
B	~~4~~	~~1~~	~~P2D-8~~				
B	5	1	P2E-8	8.625 OD x .500 THK STL, BLK, X-HVY, ASTM-A53, TY S, GR B	PMO 6450-675		
A	6	24"	P1-1	1.315OD×.179 THK, STL, BLK, X-HVY, ASTM-A53, TY S, GR B	K57-07-104		
	7		VALVE NO.				
A	8	1	V-548	1 GLOBE STOP VALVE, STL, SW 600#, ASTM-A105, OR A181, GR 1	6450-M9 ⑧	MD-PS	
	9						
	10		FITTING NO.				
B	11	1	F-1	3/4 HOSE ADAPTER ASSEMBLY BRASS	MO 283127 SH4B, L1	ST-PS	
B	12	3	80WS2	8 BACKING RING, STL, ASTM A109 FOR 8.625 OD×.500 THK PIPE	97-18-138		
	13						
	14						
	15		HANGER NO.				
B	16	5	H16-8	PIPE HANGER TY16 FOR 8" PIPE DWG 257056	MO 2600-135 S-7AF, L-1	ST-PS	
	17						
	18						

REMARKS -

SERVICE - CONT STEAM SYS FR 73-77
GROUP NO. PS 172 6450-0706-1001
APPLICABLE HULLS 613C 614C Yes Yes
DWG NO. 6450-776 SHEET 4 REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1						
A	2	1	P2F-8	8.625OD×.500 THK STL, BLK X-HVY, ASTM-A53, TY S, GR B	PMO 6450-675	PS	
A	3	1	P2G-8				
A	4	24"	P1-1	1.315OD×.179 THK, STL, BLK X-HVY, ASTM-A53, TY S, GR B	K57-07-104		
	5						
	6						
	7						
	8		VALVE NO.				
A	9	1	V-549	1 GLOBE STOP VALVE, STL, SW 600#, ASTM-A105 OR A181 GR 1	6450-M9 ⑧	MD-PS	
	10						
	11						
	12		FITTING NO.				
B	13	1	F-1	3/4 HOSE ADAPTER ASSEMBLY BRASS	MO 283127 SH4B, L1	ST-PS	
A	14	2	80WS2	8 BACKING RING, STL, ASTM-A109 FOR 8.625OD×.500 THK PIPE	97-18-138		
B	15	2	F-2	ANCHOR POINT, ½ x 3 FB, 6 LG STEEL, ABS GR.A, OR EQUAL	71-30-515		
	16						
	17		HANGER NO				
B	18	4	H16-8	PIPE HANGER TY16 FOR 8" PIPE DWG 257056	MO 2600-135 S-7AF, L-1	ST-PS	

REMARKS -

SERVICE - CONT STEAM SYS FR 77-81
GROUP NO. PS 175 6450-0806-1001
APPLICABLE HULLS 613C 614C Yes Yes
DWG NO. 6450-776 SHEET 5 REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	P2H-8	8.625OD×.500 THK, STL, BLK. X-HVY, ASTM-A53, TY S, GR B	PMO 6450-675	PS	
B	2	1	P2J-8				
A	3	24"	P1-1	1.315 OD X .179 THK, STL, BLK X-HVY, ASTM-A53, TY S, GR B	K57-07-104		
B	4	1	P2K-8	8.625 OD x .500 THK, STL, BLK X-HVY, ASTM-A53, TY S, GR B	PMO 6450-675		
	5						
	6						
	7						
	8		FITTING NO.				
B	~~9~~	~~2~~	~~F-2~~	~~ANCHOR POINT, ½×1½ FB, 3LG ABS GR A, OR EQUAL~~	~~71-30-240~~	~~PS~~	
B	10	3	80WS2	8 BACKING RING, STL, ASTM-A109 FOR 8.625OD×.500 THK PIPE	97-18-138	ST-PS	
B	11	1	F-1	3/4 HOSE ADAPTER ASSEMBLY BRASS	MO 283127 SH4B, L1		
	12		HANGER NO.				
B	13	3	H16-8	PIPE HANGER TY16 FOR 8" PIPE DWG 257056	MO 2600-135 S-7AF, L-1	ST-PS	
B	14	3	H60-8	SPECIAL PIPE HGR TY60 FOR 8" PIPE DWG 2600-135	MO 2600-135 S-7L, L-1		
	15		VALVE NO.				
A	16	1	V-550	1 GLOBE STOP VALVE, STL, SW, 600#, ASTM-A105, OR A181, GR 1	6450-M9 ⑧	MD-PS	
	17						
	18						

REMARKS -

SERVICE - CONT STEAM SYS FR 81-85
GROUP NO. PS 175 6450-0906-1001
APPLICABLE HULLS 613C 614C Yes Yes
DWG NO. 6450-776 SHEET 6 REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	1	P2L-8	8.625OD×.500 THK, STL, BLK. X-HVY, ASTM-A53, TY S, GR B	PMO 6450-675	PS	
B	2	1	P2M-8				
A	3	24"	P1-1	1.315OD×.179 THK, STL, BLK. X-HVY, ASTM-A53, TY S, GR B	K57-07-104		
	4						
	5		HANGER NO				
B	6	5	H16-8	PIPE HANGER TY16 FOR 8" PIPE DWG 257056	MO 2600-135 S-7AF, L-1	ST-PS	
	7						
	8						
	9		VALVE NO.				
A	10	1	V-551	1 GLOBE STOP VALVE, STL, SW, 600#, ASTM-A105 OR A181, GR 1	6450-M9 ⑧	MD-PS	
	11						
	12						
	13		FITTING NO.				
B	14	1	F-1	3/4 HOSE ADAPTER ASSEMBLY BRASS	MO 283127 S4B, L1	ST-PS	
B	15	1	80WS2	8 BACKING RING, STL, ASTM-A109 FOR 8.625OD×.500 THK PIPE	97-18-138		
B	16	2	F-2	ANCHOR POINT, ½ x 3FB, 6 LG STEEL, ABS GR.A, OR EQUAL	71-30-515		
	17						
	18						

REMARKS -

SERVICE - CONT STEAM SYS FR 85-89
GROUP NO. PS 177 6450-1006-1001
APPLICABLE HULLS 613C 614C Yes Yes
DWG NO. 6450-776 SHEET 7 REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	P3M-10	10.750OD×.365 THK, STL, BLK, SCH. 40, ASTM-A53, TY S, GR B	PMO 6451-458	PS	
A	2	1	P3N-10				
B	~~3~~	~~1~~	~~P3P-10~~				
B	~~4~~	~~1~~	~~P3Q-10~~				
B	~~5~~	~~1~~	~~P3R-10~~				
	6						
	7						
	8		FITTING NO.				
B	9	3	100WS1	10 BACKING RING, STL, ASTM-A109 FOR 10.750OD×.365 THK PIPE	97-18-141	ST-PS	
	10						
	11						
	12						
	13						
	14						
	15		HANGER NO.				
B	16	5	H16-10	PIPE HANGER TY16 FOR 10" PIPE DWG 257056	MO 2600-135 S-7AF, L-5	ST-PS	
	17						
	18						

REMARKS -

SERVICE - CONT STEAM EXH SYS FR 73-77
GROUP NO. PS 172 6451-0706-1001
APPLICABLE HULLS 613C 614C Yes Yes
DWG NO. 6450-776 SHEET 8 REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1						
A	2	1	P3S-10	10.750OD×.365 THK, STL, BLK SCH. 40, ASTM-A53, TY S, GR B	PMO 6451-458	PS	
A	3	1	P3T-10				
	4						
	5						
	6						
	7						
	8		FITTING NO.				
A	9	2	100WS1	10 BACKING RING, STL, ASTM-A109 FOR 10.750OD×.365 THK PIPE	97-18-141	ST-PS	
B	10	2	F-2	ANCHOR POINT, ½ x 3FB, 6"LG STEEL, ABS GR.A, OR EQUAL	71-30-515	ST-PS	
	11						
	12						
	13						
	14		HANGER NO				
B	15	4	H16-10	PIPE HANGER TY16 FOR 10" PIPE DWG 257056	MO 2600-135 S-7AF, L-5	ST-PS	
	16						
	17						
	18						

REMARKS -

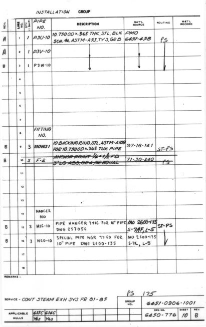
SERVICE - CONT STEAM EXH SYS FR 77-81
GROUP NO. PS 175 6451-0806-1001
APPLICABLE HULLS 613C 614C Yes Yes
DWG NO. 6450-776 SHEET 9 REV. B

6450-776

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80
FRAME
8X

6450-776



INSTALLATION GROUP

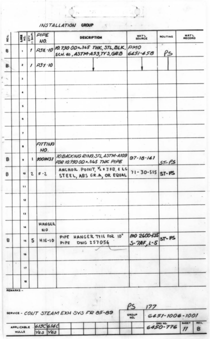
REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A		1	1	P3U-10	10.750OD×.365 THK.STL, BLK SCH. 40, ASTM-A53, TY 3, GR B	PMO 6451-458	PS	
A		2	1	P3V-10	↓	↓	↓	
B		3	1	P3W-10	↓	↓	↓	
		4						
		5						
		6						
		7						
		8		FITTING NO.				
B		9	3	100WS1	10 BACKING RING, STL, ASTM-A109 FOR 10.750OD×.365 THK PIPE	97-18-141	ST-PS	
B		10	2	F-2	~~ANCHOR POINT ¼×1½ FB 3"LG ABS, GR A, OR EQUAL~~	71-30-240	~~PS~~	
		11						
		12						
		13						
		14		HANGER NO				
B		15	3	H16-10	PIPE HANGER TY16 FOR 10" PIPE DWG 257056	MO 2600-135 S-7AF, L-5	ST-PS	
B		16	3	H60-10	SPECIAL PIPE HGR TY 60 FOR 10" PIPE DWG 2600-135	MO 2600-135 S-7L, L-5	↓	
		17						
		18						

REMARKS -

SERVICE - CONT STEAM EXH SYS FR 81-85

PS 175

SERVICE - CONT STEAM EXH SYS FR 81-85								GROUP NO.	6451-0906-1001		
APPLICABLE HULLS	613C Yes	614C Yes							DWG NO. 6450-776	SHEET 10	REV. B



INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	1	P3X-10	10.750 OD×.365 THK, STL, BLK, SCH. 40, ASTM-A53, TY S, GR B	PMO 6451-458	PS	
B		2	1	P3Y-10	↓	↓	↓	
		3						
		4						
		5						
		6						
		7						
		8		FITTING NO.				
B		9	1	100WS1	10 BACKING RING, STL, ASTM-A109 FOR 10.750 OD×.365 THK PIPE	97-18-141	ST-PS	
B		10	2	F-2	ANCHOR POINT, ½×3 FB, 6 LG STEEL, ABS GR.A, OR EQUAL	71-30-515	ST-PS	
		11						
		12						
		13						
		14		HANGER NO				
B		15	5	H16-10	PIPE HANGER TY16 FOR 10" PIPE DWG 257056	MO 2600-135 S-7AF, L-5	ST-PS	
		16						
		17						
		18						

REMARKS -

PS 177

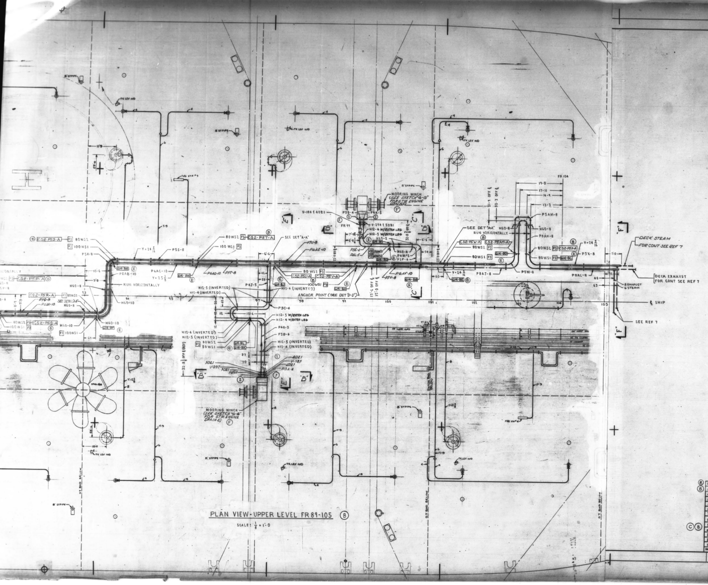
SERVICE - CONT STEAM EXH SYS FR 85-89								GROUP NO.	6451-1006-1001		
APPLICABLE HULLS	613C Yes	614C Yes							DWG NO. 6450-776	SHEET 11	REV. B

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X


TK LEV IND
8" STPIPE
FR 104
MOORING WINCH (SEE SKETCH "G-G" FOR STM ENGINE DRAINS)
V-104 (4081)
FR 97
H12-4 W/EXTRA LEG
H12-5 W/EXTRA LEG
SEE DET "A-A"
SEE DET "AA"
RUN HORIZONTALLY
CS2-P5T-A
CS2-P5S-A
CS2-P5P-A
CS2-P5R-A
CS2-P5Q-A
CS2-P5U-A
CS2-P5V-A
CS2-P5W-A
CS2-P5AM-A
CS2-P5X-A
80WS2
100WS1
80WS1
P5S-8
P5T-8
P5W-8
P5X-8
P5AM-8
P8AL-8
P8A7-8
P6AC-10
P6AD-10
P6AF-10
H60-8
H60-10
H12-5 (INVERTED)
H12-4 (INVERTED)
ANCHOR POINT (SEE DET "D-D")
DECK STEAM FOR CONT SEE REF 7
DECK EXHAUST FOR CONT SEE REF 7
8 EXHAUST & STEAM
℄ SHIP
SEE REF 7
"F"
"B"
"C"
"E"
MOORING WINCH (SEE SKETCH "G-G" FOR STM ENGINE DRAINS)
O.T. BHD BELOW

PLAN VIEW-UPPER LEVEL FR 89-105 Ⓑ

SCALE: 1/8 = 1'-0

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHO	OWNER DATE	OWNER APPD
A	ALL	INITIAL ISSUE	☒	☒	☒	☒
B	ALL	DESIGN DEVELOPMENT: RELOCATED EXPANSION LOOP AT FR 97 IN PIPES P-3 & P-4. ADDED PIPE HANGERS TO PIPES P-3, P-4, P-5, & P-6. ADDED NOTE 16. DELETED INSULATION FROM PIPES P-3, P-4, P-5, & P-6 ON DETAILS "C-C" & "E-E". DELETED NOTES 5, 9, & 10, AND REFS 4 & 5. ADDED EXPANSION LOOP AT FR 103 IN PIPES P-5 & P-8. ADDED SECTION VIEW "F-F". INCREASED SIZE OF P-6 ON DETAIL "D-D". NOTE 12: EXHAUST WAS CLASS II. RRO JCB ADDED WELD INDEX NOS., REF 12 & NOTE 17 JCB IN DETAIL "A-A", 1" CRUCIFORM INDICATED. JWS JCB	1/26/78	LWC	11/4/78	LTR 1943V
C	ALL	ADDED INSULATION TO PIPES P-3, P4, P5, & P6 ON DETAILS "C-C" & "E-E". REINSTATED NOTE 10 & REF. 5. ALL TO SUIT REF. 5.	3/12/78	LWC		
D		NOTE 18 ADDED. THIS INCORPORATES LAR LWC-NO. 48.	11/3/78	LWC		
E		"Y" STRAINERS ADDED IN 4" SUPPLY PIPING TO MOORING WINCHES TO SUIT DESIGN DEVELOPMENT JWS ADDED WELD INDEX NUMBERS FOR 614C ONLY. ADDED NOTE #19 + REF #13. JCB	1/8/79	LWC		
F		ADDED DRAINS FOR STEAM ENGINES ON THE MOORING WINCHES. SKETCH G-G ADDED TO SUIT. THIS INCORPORATES LIAISON NO. LWC-NO. 74. JWS	2/13/79	LWC		

ABS LTR DTD 3/6/78
USCG LTR 12/19/77

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCES 1 AND 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REFERENCE 1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. AND REFERENCE 3.
4. BACKING RINGS AND COUPLINGS SHOWN IN LIST OF MAT'L ARE TO BE USED AS REQUIRED.
5. Ⓑ ~~CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMP AND ETC.~~
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REFERENCE 6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REFERENCE 1.
9. Ⓑ ~~GAGE PIPING IS TO BE IN ACCORDANCE WITH REFERENCE 4.~~
10. Ⓒ INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REFERENCE 5.
11. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
12. Ⓑ ALL DECK STEAM PIPING ON THIS DRAWING IS CLASS I. ALL DECK EXHAUST PIPING ON THIS DRAWING IS CLASS I.
13. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOW: BUTT WELDS TYPE P-3, SOCKET WELDS TYPE P-14, AND FLANGE WELDS TYPE P-16A ON REFERENCE 3 EXCEPT AS OTHERWISE INDICATED.
14. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
15. ALL HOLECUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.
16. Ⓑ ALL PIPE HANGERS ON PIPE P-5 ARE TYPE H16-8 UNLESS OTHERWISE NOTED. ALL PIPE HANGERS ON PIPE P-6 ARE TYPE H16-10 UNLESS OTHERWISE NOTED.
17. Ⓑ SYMBOLS CS2-P5N-A ETC. INDICATE WELDS REQUIRING NDT AND/OR STRESS RELIEF TO SUIT REF 3 & AS LISTED ON REF 12.
18. Ⓓ ALL "U" BOLT HANGERS ARE TO BE INSTALLED WITH A SLIGHT GAP BETWEEN THE TOP OF THE PIPE AND THE BOTTOM OF THE "U"-BOLT TO PERMIT FREE AXIAL MOVEMENT OF THE PIPE. AFTER THE "U"-BOLTS ARE SET, THE NUTS ARE TO BE SECURED BY EITHER BEING CENTER PUNCHED OR TACK WELDED. THIS DOES NOT APPLY TO HANGERS AT ANCHOR POINTS.
19. Ⓔ WELD JOINTS MARKED THUS 614- ARE TO BE RADIOGRAPHED FOR H614C ONLY IN ACCORDANCE WITH REF #13.

FOR LIST OF MATERIAL SEE REF 9

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS	
OWNERS LTR 1630V DTD 4-27-77	ABS LTR DTD 6-30-77
	USCG LTR DTD 5-25-77

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

GROUPS: 6450-1106-1001 PI 6451-1106-1001 PI
6450-1206-1001 PI 6451-1206-1001 PI
6450-1306-1001 PI 6451-1306-1001 PI
6450-1406-1001 PI 6451-1406-1001 PI

	NO.	REFERENCES	DWG NO.
Ⓔ	13	WELD INDEX TABULATION FOR MISC PIPING SYS (614C ONLY)	283301
Ⓑ	12	WELD INDEX-CONT. STM-UP. DK FR 89-105	6450-837
	11	CONT EXH PIPING ARR UPPER DK FR 89-105 PIPE DET	6451-459
	10	CONT STM & EXH PIPING ARR UPPER DK FR 73-89	6450-775
	9	CONT STEAM & EXH PIPING UPPER DK FR 89-105 L/M	6450-778
	8	CONT STM PIPING ARR UPPER DK FR 89-105 PIPE DET	6450-676
	7	CONT STM & EXH PIPING ARR UPPER DK FWD FR 105	6450-779
	6	PAINTING SCHEDULE	8300-40
Ⓒ Ⓑ	5	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
	4	~~TYPICAL ARRANGEMENT OF GAGE PIPING~~	~~0750-401~~
	3	FABRICATION & WELDING INSTRUCTIONS-CL I & II PIPING	257035
	2	↑ ↑ ↑ ↑ ↑ ARR	6450-692
	1	DIAGRAM- CONT STEAM GEN SYS -LIST	6450-693

SCALE 1/8 & AS NOTED = 1 FT
DRAWN Randy Walters
CHECKED Bill Kelly
SECT MGR L.W. Cresswell
DATE COMPL. 3-11-77
EXAMINED
AUTHORIZED
DATE 3-11-77
TECH APPROVAL 3-21-77
CSD APPROVAL R. L. Warrington

CONTAMINATED STEAM AND
EXHAUST PIPING-UPPER DECK
FR 89-105 ARR

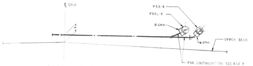
USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO.

DWG NO. 6450-777 REV F SHEET NO. 1 OF 1

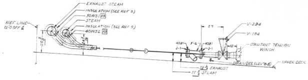
6450-777

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

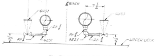
SEPT. '80
FRAME 1
10X


℄ SHIP
PSX-8
P6AL-8
8 EXH.
6 STM.
UPPER DECK
FOR CONTINUATION SEE REF 7

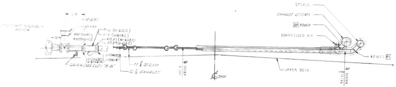
SECTION "F-F" (B)
SCALE: 1/2" = 1'-0"


REF LINE 12'-0" OFF ℄
EXHAUST STEAM
INSULATION (SEE REF 5)
30WS1 P3
STEAM
INSULATION (SEE REF 5)
40WS2 P3
4021
J-1
F-6
4021
J-1
V-294
V-164
CONSTANT TENSION WINCH
DRAIN (SEE ELEV "B-B")
UPPER DECK
12 1/4 EXHAUST
11 7/8 STEAM

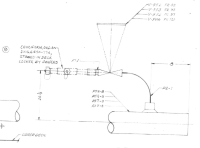
SECTION "C-C" (B) (C) (E)
SCALE: 1/2"=1FT


℄ WINCH
6VS1
6ES1
UPPER DECK

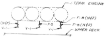
ELEVATION "B-B"
SCALE: 1 1/2"=1FT


CONSTANT TENSION WINCH
V-237
V-143
STEAM
EXHAUST STEAM
P3 50WS1
COMPRESSED AIR
40WS1 P3
DRAIN (SEE ELEV "B-B")
11 7/8 STEAM
12 1/4 EXHAUST
UPPER DECK
℄ SHIP

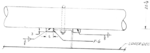
SECTION "E-E" (B) (C) (E)
SCALE: 1/2"=1FT


(B)
CRUCIFORM, DWG ON DWG 6450-774, STOWED IN DECK LOCKER BY OWNERS
F-7
P2-1
PSN-8
PSQ-8
PST-8
PSV-8

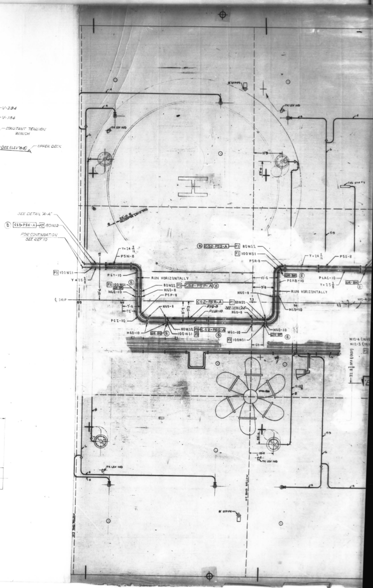
DETAIL "A-A"
SHOWING STEAM CONN FOR PORTABLE GAS FREEING BLOWERS
SCALE: 3"=1FT


STEAM ENGINE
F-8 (N&F)
V-1
F-9
UPPER DECK

SKETCH "G-G"
SHOWING CONDENSATE DRAIN ON STEAM ENGINE
NTS
(F)


F-6
UPPER DECK

DETAIL "D-D" (B)
SHOWING PIPE ANCHOR
NTS


SEE DETAIL "A-A"
(B) CS2-PSN-A P3 80WS2
FOR CONTINUATION SEE REF 10
PSN-8
P3 100WS1
RUN HORIZONTALLY
80WS2 P3 CS2-PSP-A (B)
CS2-PSS-A
P3 80WS2
P3 100WS1
PSS-8
P6AC-10
RUN HORIZONTALLY
CS2-PSR-A
CS2-PSQ-A
H60-10
℄ SHIP
TK LEV IND

6450-777

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 2
10X

6450.778

CSD VAULT

E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS PARTIAL ISSUE REV "D"
GROUPING YES
DATE 2-13-79
SIGNED L W Cresswell

YARD PRINTS · ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS																			
REV.	D	D	B	B	B	D	C	B	D	C	B	B	B	B	A	B	B	A	B
SHEET	1	2	3	4	5	5A	6	7	8	9	10	11	12	12A	13	14	14A	15	16

GROUP SEE GROUP SHEETS
MC NO. # # # #

DWG. REV. — HULL APPLIC.	NN HULLS ONLY	
REV.	613C	614C
A	Yes	Yes
B	YES	YES
C	YES	YES
D	NO	YES

NNS&DDCo HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C	310		
613C	309		

APPROVALS
OWNERS LTR 1630V DTD 4-27-77
ABS LTR DTD 6-30-77
USCG LTR SER 4170 DTD 5-23-77

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING

SCALE NONE =1 Ft.
DRAWN Randy Walters
CHECKED
SECT. MGR. L W Cresswell
DATE COMPL. 3-11-77
EXAMINED
AUTHORIZED E E Stephenson
DATE 3-11-77
TECH. APPROVAL 3-21-77
CSD APPROVAL R. L. Henning

GROUPED CHK. BY · DATES COMP. PART · HULL 613C GROUP NO. KEY

TYPE OF DWG. WORKING DRAWING

TITLE CONTAMINATED STEAM & EXHAUST PIPING ARR UPPER DECK FR 89-105 L/M

100%

DWG. NO. 6450-778 REV D. SHEET NO. 1 OF 16

MS 8½ X 14

USCG LTR DTD 12-19-77

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE	#	#	#	#
B	2	REF 4: ADDED.				
	3	NOTE 4 ADDED.				
	4	LINES 13 & 14: ADDED				
	5	RELOCATED JOINT AT FR 97½, P5T-8. ALT'D P3B-4 & P3C-4. ADDED LINE 13				
	5A	ADDED				
	7	RELOCATED JOINT AT FR 97½, P5U-8. LINE 14: PIPE ANCHOR WAS ¼ x 1½ FB, 3 LG				
	8	LINES 7, 8, 9 & 10: ADDED				
	10	LINES 4, 14, & 15: ADDED. LINE 10: QTY WAS 2. RELOCATED JOINT & ADDED 6 BRANCH & 8x6 REDUCER TO P5X-8.				
	11	LINES 14 & 15: ADDED				
	12	RELOCATED JOINT AT FR 97½, P6AD-10. ALT'D P4H-5 & P4J-5				
	12A	ADDED				
	14	LINE 13: PIPE ANCHOR WAS ¼ X 1½ FB, 3 LG. RELOCATED JOINT AT FR 97½, P6AE-10. ADDED 10x8 REDUCER TO P6AF-10.				
	14A	ADDED				
	16	LINES 1, 2, & 10: DELETED. LINES 3-5, 11, & 17: ADDED				
	4 5 7	LINE 9 - ALT. DESCRIPTION COLUMN 10 13				
	4 5 7	LINE 9 WAS 1" S/M WAS M0216707 S4, L9 LINE 10 LINE 13	10/25/77	LWC	3/14/78	SHELL LTR 1948V
C	5A 6 8 9	LINES 6, 7, 9 & 10 ADDED LINES 6-12 ADDED LINES 12 & 13 ADDED LINES 7, 8 & 9 ADDED	1/8/79	LWC		
D	5A 8	LINES 11, 12 & 13 ADDED LINES 2, 14 & 15 ADDED	2/8/79	LWC		

NO.	REFERENCES	DWG. NO.
4	PAINTING SCHEDULE	8300-40
3	CONT EXHAUST SYS UPPER DK ARR FR 85-105 PIPE DETAILS	6451-459
2	CONT STEAM SYS UPPER DK ARR FR 85-105 PIPE DETAILS	6450-676
1	CONTAMINATED STEAM & EXHAUST SYS UPPER DK FR 89-105 ARR	6450-777

HULL NO. 613C & 614C DWG. NO. 6450-778
REVISION D SHEET 2 OF 16

833

NOTES:

1. FOR NOTES, REFERENCES, AND ARRANGEMENT OF PIPING, SEE REFERENCE 1.
2. FOR PIPE DETAILS, SEE REFERENCES 2 & 3.
3. WHERE ASTM-B61 IS USED, CERTIFICATION IS MANDATORY, AND ONE CHEMICAL TEST AND ONE TENSION TEST IS REQUIRED FROM EACH HEAT.
4. ALL PIPE HANGERS TO BE COATED IN ACCORDANCE WITH NOTE 4 ON SHT 12 OF REF 4.

HULL NO. 613C & 614C DWG. NO. 6450-778
REVISION B SHEET 3 OF 16

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	48"	P2-1	1.315 O.D. x .179 THK, STL, BLK X-HVY ASTM-A53, TY S, GR B	K57-07-104	PS	
A	2	1	P5N-8	8.625 O.D. x .500 THK, STL, BLK. X-HVY, ASTM-A53, TY S, GR B	6450-676	↓	
A	3	1	P5P-8	↓	↓	↓	
A	4	1	P5Q-8	↓	↓	↓	
	5						
	6						
	7						
	8		FITTING NO.				
B	9	2	F-1	¾ HOSE ADAPTER ASSEMBLY BRASS	MO 283127 S48 L1	ST-PS	
A	10	3	80WS2	8 BACKING RING, STL, ASTM-A109 FOR 8.625 O.D. x .500 THK PIPE	97-18-138	↓	
	11						
	12		HANGER NO				
B	13	3	H16-8	8 "U-BOLT", ⅝ D. ROD, STL. GALV., W/(4) GALV. HEX. NUTS	MO 2600-135 S-7AF, L-1	ST-PS	
B	14	4	H60-8	8 SPECIAL "U-BOLT", ⅝ D. ROD, STL. GALV. W/(4) GALV. HEX. NUTS	MO 2600-135 S-7L, L-1	↓	
	15		VALVE NO.				
A	16	1	V-552	1 GLOBE STOP VALVE, STL, SW, 600#, ASTM-A105 OR A181 GR 1	⑧ 6450-C9	MD-PS	
A	17	1	V-553	↓	⑧ ↓	↓	
	18						

REMARKS -

SERVICE - CONT STEAM SYS FR 89-93
GROUP NO. PS 181 6450-1106-1001 P1

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	Yes	Yes	6450-778	4	B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	24"	P2-1	1.315 O.D. x .179 THK, STL, BLK X-HVY ASTM-A53, TY S, GR B	K57-07-104	PS	
A	2	1	P5R-8	8.625 O.D. x .500 THK, STL, BLK X-HVY, ASTM-A53, TY S, GR B	6450-676	↓	
A	3	1	P5S-8	↓	↓	↓	
B	4	1	P5T-8	↓	↓	↓	
A	5	1	P3A-4	4.500 O.D. x .337 THK, STL, BLK X-HVY ASTM-A53, TY S, GR B	↓	↓	
B	6	1	P3B-4	↓	↓	↓	
B	7	1	P3C-4	↓	↓	↓	
A	8	12"	P1-¾	1.050 O.D. x .154 THK, STL, BLK, X-HVY, ASTM-A53, TY S, GR B	K57-07-103	↓	
	9		FITTING NO.				
B	10	1	F-1	¾ HOSE ADAPTER ASSEMBLY BRASS	MO 283127 S48, L1	ST-PS	
A	11	3	80WS2	8 BACKING RING, STL, ASTM-A109 FOR 8.625 O.D. x .500 THK PIPE	97-18-138	↓	
A	12	2	40WS2	4 BACKING RING, STL, ASTM-A109 FOR 4.500 O.D. x .337 THK PIPE	97-18-106	↓	
B	13	1	6ES1	¾ ELBOW, 90°, SW, STL, ASTM-A234 ANSI B16.11, 3000#	⑱ 6951-C3	MD-PS	
	14		VALVE NO				
	15	1	6VS1	¾ GLOBE STOP VALVE, STL, 600# ASTM-A105 OR A181, GR 1	26-09-276	ST-PS	
	16	1	V-185	4 GATE VALVE, STL, FLG'D. 150# ASTM-A105 OR A181 GR 1	㊶ 6451-C3	MD-PS	
A	17	1	V-554	1 GLOBE STOP VALVE, STL, SW 600#, ASTM-A105 OR A181, GR 1	⑧ 6450-C9	↓	
	18						

REMARKS -

SERVICE - CONT STEAM SYS FR 93-97
GROUP NO. PS 181 6450-1206-1001 P1

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	Yes	Yes	6450-778	5	B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	HANGER NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	4	H16-8	8" U-BOLT" ⅝ DIA. ROD, STL. GALV., W/(4) GALV. HEX. NUTS	MO 2600-135 S-7AF, L-1	ST-PS	
B	2	2	H60-8	8 SPECIAL "U-BOLT" ⅝ D. STL. GALV. W/GALV. HEX. NUTS	MO 2600-135 S-7L, L-1	↓	
	3						
B	4	6	H12-4	PIPE HANGER TY12 W/O LINER FOR 4" PIPE DWG 2600-135	MO 2600-135 S-7G, L-6	ST-PS	
	5						
C	6	1	F-6	4" Y-STRAINER 150# FLGD. C. STL (H-613C ONLY)	P.O. Ⓒ 6450-C74	ST-PS	
C	7	2	J-1	4" FLANGE 150# SLIP-ON ASTM-A105, ANSI-B.16.5 (H-613C ONLY)	25-18-438	↓	
	8						
C	9	1	F-7	4" Y-STRAINER 300# FLGD C. STL (H-614C ONLY)	P.O. ① 6450-C74	ST-PS	
C	10	2	J-2	4" FLANGE 300# SLIP-ON ASTM-A105, ANSI-B16.5 (H-614C ONLY)	25-18-518	↓	
D	11	5	V-1	3/8" GATE VALVE SCR'D 125# WSP BRONZE	S/ 26-08-100	ST-PS	
D	12	2	F8	1/2 X 3/8 REDUCING BUSHING 150# SCR'D M.I. GALV	S/ 25-05-326	↓	
D	13	5	F-9	3/8" PIPE NIPPLE EX-HVY STL ASTM-A106 THD 3" LG	S/ 25-14-842	↓	
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - CONT STEAM SYS FR 93-97
GROUP NO. 6450-1206-1001 P1

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	Yes	Yes	6450-778	5A	D

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	16	4021	4 150#	BOLTS	HEX HD HVY, 5/8-11UNC-2A, 3LG	6000-C7 ㉕	MD-PS	
A	2	16			NUTS	HEX HVY, 5/8-11UNC-2B	6000-C12 ⑱	↓	
A	3	2			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-278E	ST-PS	
A	4	8	①	4 300#	BOLTS	HEX HD HVY, 3/4-10UNC-2A, 2 1/4 LG	6000-C13 ㉗	MD-PS	
A	5	–			NUTS	NOT REQD	—		
A	6	1			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-248E	ST-PS	
C	7	8	4021 H-613 ONLY	4 150#	BOLTS	5/8-11UNC-2A, 3 LG, HEX HD HVY	6000-C13 ㉗	↓	
C	8	8			NUTS	5/8-11UNC-2B HEX HVY	6000-C12 ⑱	↓	
C	9	2			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-278E	↓	
C	10	16	4027 H-614 ONLY	4 300#	BOLTS	3/4-10UNC-2A, STUD 4½ LG	6000-C13 [illegible]	↓	
C	11	32			NUTS	3/4-10UNC-2B HEX HVY	6000-C12 ⑭	↓	
C	12	2			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-248E	↓	
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, ZINC PLATE
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

SERVICE - CONT STEAM SYS FR 93-97
GROUP NO. PS 181 6450-1206-1001 P1

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	Yes	Yes	6450-778	6	C

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	12"	P1-¾	1.050 O.D. x .154 THK, STL, BLK, X-HVY, ASTM-A53, TY S, GR B	K57-07-103	PS	
A	2	24"	P2-1	1.315 O.D. x .179 THK, STL, BLK, X-HVY ASTM-A53, TY S, GR B	K57-07-104	↓	
A	3	1	P3D-4	4.500 O.D. x .337 THK, STL, BLK X-HVY ASTM-A53, TY S, GR B	6450-676	↓	
A	4	1	P3E-4	↓	↓	↓	
A	5	1	P3F-4	↓	↓	↓	
B	6	1	P5U-8	8.625 O.D. x .500 THK, STL, BLK X-HVY, ASTM-A53, TY S, GR B	↓	↓	
A	7	1	P5V-8	↓	↓	↓	
	8						
	9						
	10						
	11						
	12		FITTING NO.				
B	13	1	F-1	¾ HOSE ADAPTER ASSEMBLY BRASS	MO 283127 S48, L1	ST-PS	
B	14	2	F-6	PIPE ANCHOR ½ x 3 FB, 6 LG ABS GR A OR EQUAL	71-30-515	PS	
A	15	1	6ES1	¾ ELBOW, 90°, SW, STL, ASTM-A234 ANSI-B16.11, 3000#	⑱ 6951-C3	MD-PS	
A	16	2	40WS-2	4 BACKING RING, STL, ASTM-A109 FOR 4.500 O.D. x .337 THK PIPE	97-18-106	ST-PS	
A	17	2	80WS2	8 BACKING RING, STL, ASTM-A109 FOR 8.625 O.D. x .500 THK PIPE	97-18-138	↓	
	18						

REMARKS -

SERVICE - CONT STEAM SYS FR 97-101
GROUP NO. PS 181 6450-1306-1001 P1

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	Yes	Yes	6450-778	7	B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	V-184	4 GATE VALVE, STL, FLG'D, 150# ASTM-A105 OR A181, GR 1	㊶ 6451-C3	MD-PS	
D	2	5	V-1	3/8 GATE VALVE SCR'D 125 WSP BRONZE	S/ 26-08-100	ST-PS	
A	3	1	V-5000	1 GLOBE STOP VALVE, STL, SW, 600#, ASTM-A105 OR A181, GR 1	⑧ 6450-C9	MD-PS	
A	4	1	6VS1	¾ GLOBE STOP VALVE, STL, 600# ASTM-A105 OR A181, GR 1	26-09-276	ST-PS	
	5						
	6		HANGER NO.				
B	7	4	H16-8	8 "U-BOLT" ⅝ D. ROD, STL. GALV., W/(4) GALV. HEX. NUTS	MO 2600-135 S-7AF, L-1	ST-PS	
B	8	2	H60-4	4 SPECIAL "U-BOLT" ½ D. ROD, STL. GALV. W/(4) GALV. HEX. NUTS	MO 2600-135 S-7K, L-5	↓	
B	9	1	H12-4	4" STD PIPE HGR TYPE 12 W/O LINER, INORGANIC Zc COATD	MO 2600-135 S-76, L-6	↓	
B	10	2	-	SUPPORT ASSY FOR SPECIAL HGR TYPE H60-4	MO 2600-135 S-7Y, L-5	↓	
	11						
C	12	1	F-6	4" "Y"-STRAINER 150# FLG'D C. STL	P.O. Ⓒ 6450-C74	ST-PS	
C	13	2	J-1	4" FLANGE 150# SLIP-ON ASTM-A-105, ANSI-B16.5	25-18-438	↓	
D	14	2	F-8	1/2 X 3/8 REDUCING BUSHING 150# SCR'D M.I. GALV	S/ 25-05-326	ST-PS	
D	15	5	F-9	3/8" PIPE NIPPLE EX-HVY STL ASTM-A106 THD 3" LG	S/ 25-14-842	↓	
	16						
	17						
	18						

REMARKS -

SERVICE - CONT STEAM SYS FR 97-101
GROUP NO. PS 181 6450-1306-1001 P1

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	Yes	Yes	6450-778	8	D

6450-778

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FRAME

8X

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	16	1204	4 150#	BOLTS	HEX HD HVY, 5/8-11UNC-2A, 3LG	6000-C7 ㉕	MD-PS	
A	2	16			NUTS	HEX HVY, 5/8-11UNC-2B	6000-C12 ⑱		
A	3	2			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-278E	ST-PS	
A	4	8	①	4 300#	BOLTS	HEX HD HVY, 3/4-10UNC-2A, 2 1/4 LG	6000-C13 ㉗	MD-PS	
A	5	–			NUTS	NOT REQD	–		
A	6	1			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-248E	ST-PS	
C	7	8	1204	4 150#	BOLTS	5/8-11UNC-2A, 3LG HEX HD HVY	6000-C13 ㊾		
C	8	8			NUTS	5/8-11 UNC-2B	6000-C12 ⑱		
C	9	2			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-278		
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, ZINC PLATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

SERVICE – CONT STEAM SYS FR 97-101

PS 181

APPLICABLE HULLS	613C	614C						GROUP NO.	6450-1306-1001 P1		
	Yes	Yes							DWG NO. 6450-778	SHEET 9	REV. C

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1						
A	2	1	P5W-8	8.625 O.D. × .500 THK, STL, BLK X-HVY, ASTM-A53, TY 3, GR B	6450-676	PS	
B	3	1	P5X-8				
B	4	1	P5AM-8				
	5						
	6						
	7						
	8						
	9		FITTING NO.				
B	10	3	80WS2	8 BACKING RING, STL, ASTM-A109 FOR 8.625 O.D. × .500 THK PIPE	97-18-138	ST-PS	
	11						
	12						
	13		HANGER NO.				
B	14	5	H16-8	8" "U-BOLT", 5/8 D. ROD, STL. GALV. w/(4) GALV. HEX. NUTS	MO 2600-135 S-7AF, L-1	ST-PS	
B	15	2	H60-8	8 SPECIAL "U-BOLT" 5/8 D. ROD, STL. GALV. w/(4) GALV. HEX. NUTS	MO 2600-135 S-7L, L-1		
	16						
	17						
	18						

REMARKS –

SERVICE – CONT STEAM SYS FR 101-105

PS-182

APPLICABLE HULLS	613C	614C						GROUP NO.	6450-1406-1001 P1		
	Yes	Yes							DWG NO. 6450-778	SHEET 10	REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	P6Y-10	10.750 O.D. × .365 THK. STL, BLK SCH 40, ASTM-A53, TY 3, GR B	6451-459	PS	
A	2	1	P6Z-10				
A	3	1	P6AA-10				
	4						
	5						
	6						
	7						
	8						
	9		FITTING NO.				
A	10	3	100WS1	10 BACKING RING, STL, ASTM A109 FOR 10.750 O.D. × .365 THK PIPE	97-18-141	ST-PS	
	11						
	12						
	13		HANGER NO.				
B	14	3	H16-10	10 "U-BOLT" 3/4 DIA. ROD, STL. GALV. w/(4) GALV. HEX. NUTS	MO 2600-135 S-7AF, L-5	ST-PS	
B	15	4	H60-10	10 SPECIAL "U-BOLT" 3/4 D. ROD, STL. GALV. w/(4) GALV. HEX. NUTS	MO 2600-135 S-7L, L-5		
	16						
	17						
	18						

REMARKS –

SERVICE – CONT EXHAUST SYS FR 89-93

PS 181

APPLICABLE HULLS	613C	614C						GROUP NO.	6451-1106-1001 P1		
	Yes	Yes							DWG NO. 6450-778	SHEET 11	REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	P6AB-10	10.750 O.D. × .365 THK. STL, BLK SCH 40, ASTM-A53, TY 3, GR B	6451-459	PS	
A	2	1	P6AC-10				
B	3	1	P6AD-10				
A	4	1	P4G-5	5.563 O.D. × .258 THK, STL, BLK SCH 40 ASTM-A53 TY 3, GR B			
B	5	1	P4H-5				
B	6	1	P4J-5				
A	7	12"	P1-3/4	1.050 O.D. × .154 THK STL, BLK SCH 80, ASTM-A53, TY 3, GR B	K57-07-103		
	8						
	9		FITTING NO.				
A	10	3	100WS1	10 BACKING RING, STL, ASTM-A109 FOR 10.750 O.D. × .365 THK PIPE	97-18-141	ST-PS	
A	11	2	50WS1	5 BACKING RING, STL, ASTM-A109 FOR 5.563 O.D. × .258 THK PIPE	97-18-133		
A	12	1	6ES1	3/4 ELBOW 90° SW, STL, ASTM-A234 ANSI-B16.11, 3000#	6951-C3 ⑱	MD-PS	
	13						
	14		VALVE NO.				
A	15	1	V-297	5 GATE VALVE, STL, FLG'D, 150# ASTM-A216, GR WCB	6451-C3 ㉔	MD-PS	
A	16	1	6VS1	3/4 GLOBE STOP VALVE, SW, STL 600# ASTM-A105 OR A181, GR 1	26-09-276	ST-PS	
	17						
	18						

REMARKS –

SERVICE – CONT EXHAUST SYS FR 93-97

PS 181

APPLICABLE HULLS	613C	614C						GROUP NO.	6451-1206-1001 P1		
	Yes	Yes							DWG NO. 6450-778	SHEET 12	REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	HANGER NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	4	H16-10	10 "U-BOLT" 3/4 DIA ROD, STL. GALV. W/(4) GALV. HEX NUTS	MO 2600-135 S-7AF, L-5	ST-PS	
B	2	2	H60-10	10 SPECIAL "U-BOLT" 3/4 DIA ROD STL. GALV. W/(4) GALV. HEX NUTS	MO 2600-135 S-7L, L-5		
	3						
B	4	6	H12-5	PIPE HANGER T712 W/O LINER FOR 5" PIPE DWG 2600-135	MO 2600-135 S-7G, L-11	ST-PS	
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS –

SERVICE – CONT EXHAUST SYS FR 93-97

APPLICABLE HULLS	613C	614C						GROUP NO.	6451-1206-1001 P1		
	Yes	Yes							DWG NO. 6450-778	SHEET 12A	REV. B

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	16	1206	5 150#	BOLTS	HEX HD HVY, 3/4-10UNC-2A, 3LG	6000-C13 ㉑	MD-PS	
A	2	16			NUTS	HEX HVY, 3/4-10UNC-2B	6000-C12 ⑭		
A	3	2			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-280E	ST-PS	
A	4	8	②	6 150#	BOLTS	HEX HD HVY, 3/4-10UNC-2A, 2 1/4 LG	6000-C13 ㉑	MD-PS	
A	5	–			NUTS	NOT REQD	–		
A	6	1			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-282E	ST-PS	
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, ZINC PLATED.
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

SERVICE – CONT EXH SYS FR 93-97

PS 181

APPLICABLE HULLS	613C	614C						GROUP NO.	6451-1206-1001 P1		
	Yes	Yes							DWG NO. 6450-778	SHEET 13	REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	12"	P1-3/4	1.050 O.D. × .154 THK, STL, BLK. SCH 80, ASTM-A53, TY 3, GR B	K57-07-103	PS	
	2						
	3						
	4						
A	5	1	P4K-5	5.563 O.D. × .258 THK, STL, BLK SCH 40, ASTM-A53, TY 3, GR B	6451-459	PS	
A	6	1	P4L-5				
A	7	1	P4M-5				
B	8	1	P6AE-10	10.750 O.D. × .365 THK, STL, BLK SCH 40 ASTM-A53, TY 3, GR B			
B	9	1	P6AF-10				
	10		FITTING NO.				
A	11	1	6ES1	3/4 ELBOW, 90° SW, STL, ASTM-A234 ANSI-B16.11, 3000#	6951-C3 ⑱	MD-PS	
A	12	2	100WS1	10 BACKING RING, STL, ASTM-A109 FOR 10.750 O.D. × .365 THK PIPE	97-18-141	ST-PS	
B	13	2	F-6	PIPE ANCHOR, 1/2 × 3 FB, 6 LG ABS, GR A, OR EQUAL	71-30-515	PS	
A	14	2	50WS1	5 BACKING RING, STL, ASTM-A109 FOR 5.563 O.D. × .258 THK PIPE	97-18-133	ST-PS	
	15		VALVE NO.				
A	16	1	V-294	5 GATE VALVE, STL, FLG'D, 150# ASTM-A216, GR WCB	6451-C3 ㉔	MD-PS	
	17						
A	18	1	6VS1	3/4 GLOBE STOP VALVE, SW, STL. 600# ASTM-A105 OR A181, GR 1	26-09-276	ST-PS	

REMARKS –

SERVICE – CONT EXH SYS FR 97-101

PS 181

APPLICABLE HULLS	613C	614C						GROUP NO.	6451-1306-1001 P1		
	Yes	Yes							DWG NO. 6450-778	SHEET 14	REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	HANGER NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	4	H16-10	10 "U-BOLT" 3/4 DIA ROD, STL. GALV W/(4) GALV. HEX NUTS	MO 2600-135 S-7AF, L-5	ST-PS	
B	2	2	H60-5	10 SPECIAL "U-BOLT" 3/4 DIA. ROD STL. GALV. W/(4) GALV. HEX NUTS	MO 2600-135 S-7K, L-9		
B	3	1	H12-5	5" STD PIPE HGR TYPE 12 W/O LINER, INORGANIC Zc COATED	MO 2600-135 S-7G, L-11		
B	4	2	–	SUPPORT ASSY FOR SPECIAL HGR TYPE H60-5	MO 2600-135 S-7Y, L-9		
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS –

SERVICE – CONT EXH SYS FR 97-101

APPLICABLE HULLS	613C	614C						GROUP NO.	6451-1306-1001 P1		
	Yes	Yes							DWG NO. 6450-778	SHEET 14A	REV. B

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	16	1206	5 150#	BOLTS	HEX HD HVY, 3/4-10UNC-2A, 3LG	6000-C13 ㉑	MD-PS	
A	2	16			NUTS	HEX HVY, 3/4-10UNC-2B	6000-C12 ⑭		
A	3	2			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-280E	ST-PS	
A	4	8	②	6 150#	BOLTS	HEX HD HVY, 3/4-10UNC-2A, 2 1/4 LG	6000-C13 ㉑	MD-PS	
A	5	–			NUTS	NOT REQD	–		
A	6	1			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-282E	ST-PS	
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR-B, ZINC PLATED.
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

SERVICE – CONT EXH SYS FR 97-101

PS 181

APPLICABLE HULLS	613C	614C						GROUP NO.	6451-1306-1001 P1		
	Yes	Yes							DWG NO. 6450-778	SHEET 15	REV. A

6450-778

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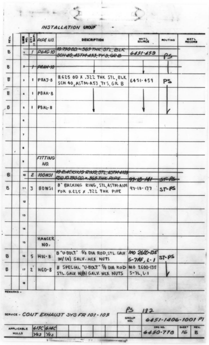
SEPT. '80

FRAME

8X



INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	~~1~~	~~P6AG-10~~	~~10.750 O.D. × .365 THK. STL, BLK SCH 40, ASTM-A53, TY S, GR B~~	~~6451-459~~	~~PS~~	
B		2	~~1~~	~~P6AH-10~~	↓	↓	↓	
B		3	1	P8AJ-8	8.625 OD X .322 THK STL, BLK SCH 40, ASTM-A53, TY S, GR B	6451-459	PS	
B		4	1	P8AK-8	↓	↓	↓	
B		5	1	P8AL-8	↓	↓	↓	
		6						
		7						
		8						
		9		FITTING NO.				
B		10	~~2~~	~~100WS1~~	~~10 BACKING RING, STL, ASTM-A109 FOR 10.750 O.D. × .365 THK PIPE~~	~~97-18-141~~	~~ST-PS~~	
B		11	3	80WS1	8" BACKING RING, STL, ASTM-A109 FOR 8.625 X .322 THK PIPE	97-18-137	ST-PS	
		12						
		13						
		14						
		15		HANGER NO.				
B		16	5	H16-8	8 "U-BOLT" 5/8 DIA ROD, STL. GALV W/ (4) GALV. HEX NUTS	MO 2600-135 S-7AF, L-1	ST-PS	
B		17	2	H60-8	8 SPECIAL "U-BOLT" 5/8 DIA ROD STL. GALV. W/(8) GALV. HEX NUTS	MO 2600-135 S-7L, L-1	↓	
		18						

REMARKS –

PS 182

SERVICE – CONT EXHAUST SYS FR 101-105

GROUP NO. 6451-1406-1001 P1

APPLICABLE HULLS	613C	614C								DWG NO.	SHEET	REV.
	Yes	Yes								6450-778	16	B

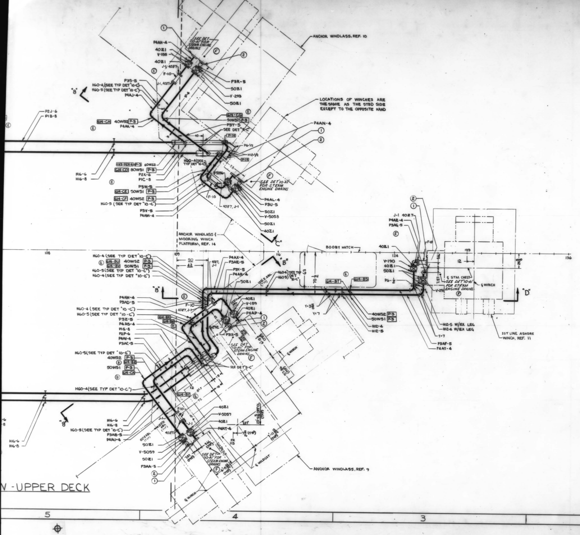
6450-778

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X


ANCHOR WINDLASS, REF. 10
SEE DET "10-A1" FOR STEAM ENGINE DRAINS
P4AH-4
40Z1
V-188
40Z1
J-1, 4027
F-10
P3S-5
H60-4 (SEE TYP DET "10-C")
H60-5 (SEE TYP DET "10-C")
P4AJ-4
P3R-5
50Z1
V-29B
50Z1
LOCATIONS OF WINCHES ARE THE SAME AS THE STBD SIDE EXCEPT TO THE OPPOSITE HAND
614-CH 40WS2 P-3
P4AK-4
614-CG 50WS1 P-3
P3T-5
SEE DET "9-C"
P-14
P4AN-4
P6-1/2
H12-1/2
P2J-6
P1B-8
C53-P2H-A P-3 60WS2
614-CD 80WS1 P-3
P2K-6
P1C-8
H16-6
H16-8
H60-4 (SEE TYP DET "10-C")
P3W-5
614-CE 50WS1 P-3
614-CF 40WS2 P-3
H60-5 (SEE TYP DET "10-C")
P3V-5
P4AM-4
F-10
4027, J-1
SEE DET "10-A1" FOR STEAM ENGINE DRAINS
P4AL-4
P3U-5
50Z1
V-5058
50Z1
40Z1
ANCHOR WINDLASS & MOORING WINCH PLATFORM, REF. 14
"C"
"B"
"8"
BOOBY HATCH
107
116
124
129
136
108
50
42
63
70
12
H60-4 (SEE TYP DET "10-C")
614-BU 40WS2 P-3
614-BV 50WS1 P-3
H60-5 (SEE TYP DET "10-C")
P4AX-4
P3AE-5
P3Y-5
P4AR-4
50Z1
H60-4 H60-5 SEE TYP DET "10-C"
614-BT
614-BS
J-1 4027
P4AZ-4
P3AG-5
40Z1
V-190
40Z1
50Z1
P6-1/2
℄ STM CHEST
SEE DET "10-A1" FOR STEAM ENGINE DRAINS
℄ WINCH
V-291
"D"
Y=3 5/8
Y=7
40WS2 P-3
50WS1 P-3
H12-4
H12-5
H12-5 W/EX LEG
H12-4 W/EX LEG
Y=7
P3AF-5
P4AY-4
1ST LINE ASHORE WINCH, REF. 11
P4AW-4
P3AD-5
F-10
4027, J-1
H60-4 (SEE TYP DET "10-C")
H60-5 (SEE TYP DET "10-C")
614-BX
614-BW
P3Z-5
P4AS-4
P1G-8
P2P-6
P4AV-4
P3AC-5
40Z1
V-189
40Z1
P4AP-4
P3X-5
SEE DET "10-A1" FOR STEAM ENGINE DRAINS
℄ WINCH
SEE DET "9-C"
H60-5 (SEE TYP DET "10-C")
40WS2 P-3
614-BZ
50WS1 P-3
614-CA
614-BY
H60-4 (SEE TYP DET "10-C")
H16-6
H16-8
H60-5 (SEE TYP DET "10-C")
P3AB-5
P4AU-4
50Z1
V-5059
50Z1
P3AA-5
40Z1
V-5057
40Z1
P4AT-4
FR 113
℄ WILDCAT
SEE DET "10-A1" FOR STEAM ENGINE DRAINS
℄ WINCH
ANCHOR WINDLASS, REF. 9
-UPPER DECK

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	AUTHD	OWNER DATE	APPD
A	—	INITIAL ISSUE	—	—	—	—
B	9B	IN DETAIL "9-B" CRUCIFORM FITTING INDICATED JWS				
	9C	F-1 THRU F-4 WAS PIPE. ABOVE TO SUIT USCG REQUEST. JLB EKD	12/20/77	LWC	1-16-78	LTR 1942V
C	ALL	ADDED NOTE 14 / REF 16.	1/27/78	LWC		
D		ADDED NOTE 15. THIS INCORPORATES LAR LWC-No. 48	4/3/78	LWC		
E		Y-STRAINERS ADDED IN 4" SUPPLY PIPING TO MOORING WINCH & WINDLASSES TO SUIT DEVELOPMENT JWS				
		ADDED WELD INDEX NUMBERS FOR 614C ONLY. ADDED NOTE #16 + REF # 17. JLB	1/8/79	LWC		
F	10-A 4A 4B 4C 4D 3B	ADDED STEAM ENGINE CONDENSATE DRAINS FOR MOORING WINCH AND ANCHOR WINDLAS. DET "10-A1" ADDED TO SUIT. THIS INCORPORATES LIAISON No. LWC-No. 74. JWS	3/7/79	LWC		

ABS LTR 3/14/78

USCG LTR 12/14/77

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCES 1 AND 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REFERENCE 1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. AND REFERENCE 3.
4. BACKING RINGS AND COUPLINGS SHOWN IN LIST OF MAT'L ARE TO BE USED AS REQUIRED.
5. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
6. PAINTING IS TO BE IN ACCORDANCE WITH REF. 4.
7. TESTS ARE TO BE IN ACCORDANCE WITH REF. 1.
8. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT. "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
9. ALL DECK STEAM PIPING ON THIS DRAWING IS CLASS I. ALL DECK EXHAUST PIPING ON THIS DRAWING IS CLASS I.
10. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS:
    BUTT WELDS TYPE P-3, SOCKET WELDS TYPE P-14, AND FLANGE WELDS TYPE P-16A ON REFERENCE 3 EXCEPT AS OTHERWISE INDICATED.
11. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
12. ALL HOLECUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.
13. SYMBOLS C53-P2H-A ETC. INDICATE WELDS REQUIRING NDT AND/OR STRESS RELIEF TO SUIT REF 3 AND AS LISTED ON REF. 15.
14. Ⓒ INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REF. 16.
15. Ⓓ ALL "U"-BOLT HANGERS ARE TO BE INSTALLED WITH A SLIGHT GAP BETWEEN THE TOP OF THE PIPE AND THE BOTTOM OF THE "U"-BOLT TO PERMIT FREE AXIAL MOVEMENT OF THE PIPE. AFTER THE "U"-BOLTS ARE SET, THE NUTS ARE TO BE SECURED BY EITHER BEING CENTER PUNCHED OR TACK WELDED. THIS DOES NOT APPLY TO HANGERS AT ANCHOR POINTS.
16. Ⓔ WELD JOINTS MARKED THUS 614- ARE TO BE RADIOGRAPHED FOR HG14C ONLY IN ACCORDANCE WITH REF # 17.

FOR LIST OF MAT'L. SEE DWG. 6450-780

	NO.	REFERENCES	DWG NO.
Ⓔ	17	WELD INDEX TABULATION FOR MISC PIPING SYS (614C ONLY)	289301
Ⓒ	16	DIRECTIONS FOR INSULATING / LAGGING PIPING	257322
	15	WELD INDEX-CONT. STM, UPPER DK. FWD FR.105	6450-838
	14	RAISED PLATF FOR ANCHOR WINDLASS & MOORING WINCHES	3300-197
	13	FDN-MOORING WINCHES UPPER DK. FWD FR 110	1220-2693
	12	FDN ANCHOR WINDLASS	1220-2657
	11	COMB. FHA-MOORING WINCH INSTALL DWG	2011-C1 #9 SH 1 & 2
	10	COMB. ANCHOR-MOORING WINCH INSTALL DWG - PORT SIDE	2011-C1 #5 SH. 1, 2 & 3
	9	COMB. ANCHOR-MOORING WINCH INSTALL DWG - STBD SIDE	2011-C1 #4 SH. 1, 2 & 3
	8	CONT. STM & EXH PIPING-UPPER DK FR 89-105 ARR	6450-777
	7	PIPE DET CONT. STM EXHAUST PIPING-UPPER DK FWD FR 105	6451-460
	6	PIPE DET CONT. STM PIPING - UPPER DK FWD FR 105	6450-677
	5	CONT. STM & EXH PIPING - UPPER DK FWD FR 105 L/M	6450-780
	4	PAINTING SCHEDULE	8300-40
	3	FABRICATION & WELDING INSTRUCTIONS - CL I & II PIPING	257055
	2	DIAGRAM - CONT STEAM GEN SYS - ARR	6450-692
	1	DIAGRAM - CONT STEAM GEN SYS - LIST	6450-693

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS

OWNERS H613C, LTR 1858V, DTD 1-5-78

ABS LTR DTD 12-13-77

USCG LTR SER 4828, DTD 11-9-77

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

DESIGN DIV.

FSCM NO. 43689

DEPT.

SCALE 3/8" = 1 FT

DRAWN W.T. RHODES

CHECKED J.G. BOYCE

SECT MGR L.W. Cresswell

DATE COMPL. 9-22-77

EXAMINED —

AUTHORIZED A. Cooling

DATE 9-22-77

TECH APPROVAL NOT REQ'D

CSD APPROVAL R. L. Harrington

CONTAMINATED STEAM AND EXHAUST PIPING - UPPER DECK FWD FR 105

USMA DESIGN T11-S-116A

USMA DWG NO. ~

HULL NO. ✓

DWG NO. 6450-779

REV F

SHEET NO. 1 OF 1

REPRODUCTION OFFICE

YARD PRINTS YES

REMARKS Rev "F"

DATE 3-7-79

YARD PRINTS

ORDERED BY DESIGN

GROUP:

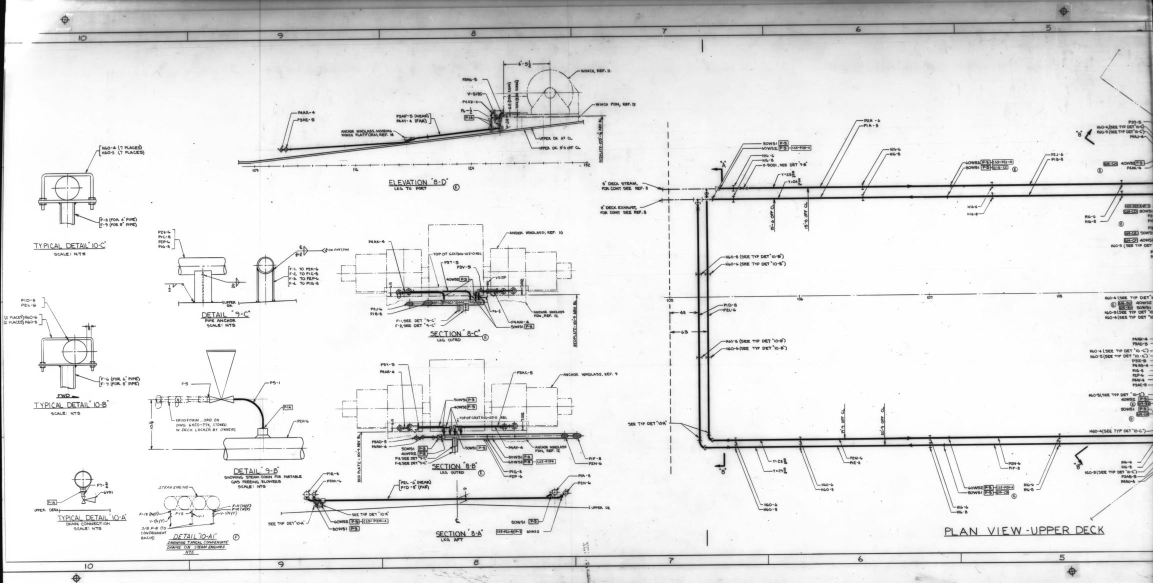
HC NO.

6450-779

SEPT. '80

FRAME 1

10X



10
9
8
7
6
5
TYPICAL DETAIL "10-C"
SCALE: NTS
H60-4 (7 PLACES)
H60-5 (7 PLACES)
F-8 (FOR 4" PIPE)
F-9 (FOR 8" PIPE)
TYPICAL DETAIL "10-B"
SCALE: NTS
F-6 (FOR 6" PIPE)
F-7 (FOR 8" PIPE)
FWD
TYPICAL DETAIL "10-A"
DRAIN CONNECTION
SCALE: NTS
P7-3/4
6VS1
P-14
UPPER DECK
DETAIL "9-C"
PIPE ANCHOR
SCALE: NTS
F-1. TO P2K-6
F-2. TO P1C-8
F-3. TO P2P-6
F-4. TO P1G-8
UPPER DK
DETAIL "9-B"
SHOWING STEAM CONN FOR PORTABLE GAS FREEING BLOWERS
SCALE: NTS
CRUCIFORM, ORD ON DWG 6450-774, STOWED IN DECK LOCKER BY OWNERS
P5-1
P2H-6
DETAIL "10-A1"
SHOWING TYPICAL CONDENSATE DRAINS ON STEAM ENGINES
NTS
STEAM ENGINE
3/8 P-8 (TO CONTAINMENT BASIN)
ELEVATION "8-D"
LKG TO PORT
WINCH, REF. 11
WINCH FDN, REF. 13
ANCHOR WINDLASS, MOORING WINCH PLATFORM, REF. 14
UPPER DK AT CL
UPPER DK 5'-3 OFF CL
SECTION "8-C"
LKG OUTBD
ANCHOR WINDLASS, REF. 10
TOP OF GRATING-103'-0 ABL
ANCHOR WINDLASS FDN, REF. 12
SECTION "8-B"
LKG OUTBD
ANCHOR WINDLASS, REF. 9
TOP OF GRATING-103'-0 ABL
SECTION "8-A"
LKG AFT
SEE TYP DET "10-A"
UPPER DK
PLAN VIEW - UPPER DECK
8" DECK STEAM, FOR CONT SEE REF. 8
8" DECK EXHAUST, FOR CONT SEE REF. 8
H60-8 (SEE TYP DET "10-B")
H60-6 (SEE TYP DET "10-B")
SEE TYP DET "10-A"

6450-779

MICRO-MASTER 105 mm
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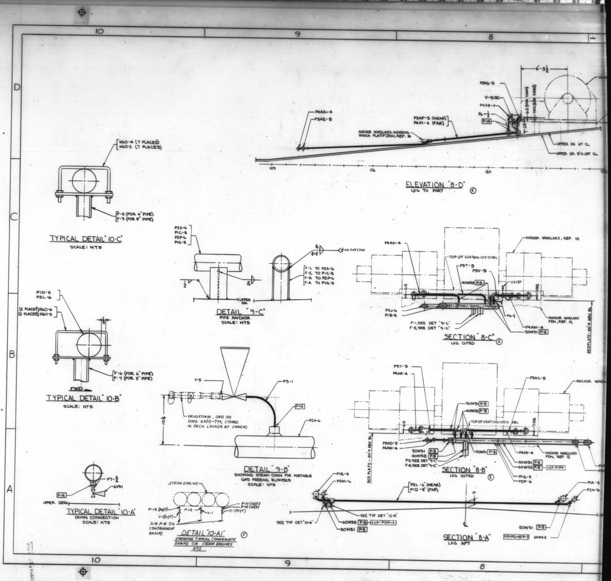
SEPT. '80
FRAME 2
10X



10
9
8
D
C
B
A
H60-4 (7 PLACES)
H60-5 (7 PLACES)
F-8 (FOR 4" PIPE)
F-9 (FOR 8" PIPE)
TYPICAL DETAIL "10-C"
SCALE: NTS
P1D-8
P2L-6
(2 PLACES) H60-6
(2 PLACES) H60-8
F-6 (FOR 6" PIPE)
F-7 (FOR 8" PIPE)
FWD
TYPICAL DETAIL "10-B"
SCALE: NTS
P7-3/4
P-14
6VS1
UPPER DECK
TYPICAL DETAIL "10-A"
DRAIN CONNECTION
SCALE: NTS
P2K-6
P1C-8
P2P-6
P1G-8
F-1 TO P2K-6
F-2 TO P1C-8
F-3 TO P2P-6
F-4 TO P1G-8
UPPER DK
DETAIL "9-C"
PIPE ANCHOR
SCALE: NTS
F-5
P5-1
P-14
P2H-6
CRUCIFORM, ORD ON DWG 6450-774, STOWED IN DECK LOCKER BY OWNERS
DETAIL "9-B"
SHOWING STEAM CONN FOR PORTABLE GAS FREEING BLOWERS
SCALE: NTS
STEAM ENGINE
F-12 (N/F)
V-1 (N/F)
F-12
V-1
F-11 (N/F)
F-12 (N/F)
V-1 (N/F)
3/8 P-8 (TO CONTAINMENT BASIN)
DETAIL "10-A1"
SHOWING TYPICAL CONDENSATE DRAINS ON STEAM ENGINES
NTS
F
P4AX-4
P3AE-5
ANCHOR WINDLASS, MOORING WINCH PLATFORM, REF. 14
P3AF-5 (NEAR)
P4AY-4 (FAR)
P3AG-5
V-513S
P4AZ-4
P-14
6'-5 1/2"
UPPER DK AT CL
UPPER DK 5'-3 OFF CL
109
116
124
ELEVATION "8-D"
LKG TO PORT
E
P4AK-4
TOP OF GRATING 103'-0 ABL
P3T-5
P3V-5
40WS2
P-3
V513P
ANCHOR WINDLASS, REF. 10
P2J-6
P1B-8
F-1, SEE DET "9-C"
F-2, SEE DET "9-C"
P4AM-4
50WS1
P-3
ANCHOR WINDLASS FDN, REF. 12
SECTION "8-C"
LKG OUTBD
E
BEDPLATE - 101'-9 ABV BL
P3Y-5
P4AR-4
P3AC-5
ANCHOR WINDLASS
50WS1
40WS2
TOP OF GRATING 103'-0 ABL
P3AD-5
P4AW-4
P4AV-4
F-3 SEE DET "9-C"
F-4 SEE DET "9-C"
80WS1
60WS2
CS3-P2PA
P1G-8
P2P-6
ANCHOR WINDLASS FDN, REF. 12
SECTION "8-B"
LKG OUTBD
E
BED PLATE - 101'-9 ABV BL
P1E-8
P2M-6
P2L-6 (NEAR)
P1D-8 (FAR)
P1A-8
P2H-6
SEE TYP DET "10-A"
60WS2
P-3
CS3-P2M-A
80WS1
SECTION "8-A"
LKG AFT
CS3-P2L-A
60WS2

6450-779

MICRO-MASTER 105 mm

K+E

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ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 3

10X

6450-780

CSD VAULT

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS Partial Issue For Rev "D"
GROUPING YES
DATE 3-7-79
SIGNED L.W. Creswell

USCG 12/17/77 ABS 3-6-78

YARD PRINTS / ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS													
REV.	D	D	A	B	A	C	D	C	C	A	B	A
SHEET	1	2	3	4	5	6	7	8	9	10	11	12

GROUP SEE GROUP SHEETS
MC NO. —

DWG. REV. — HULL APPLIC.

REV.	613C	614C
A	YES	YES
B	YES	YES
C	YES	YES
D	NO	YES

NNS&DDCO HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C	310		
613C	309		

APPROVALS
OWNERS H613C, LTR 1858V DTD 1-5-78
ABS LTR DTD 12-23-77
USCG LTR. SER 4828 DTD 11-9-77

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING

992

SCALE NONE =1 Ft.
DRAWN W.T. RHODES
CHECKED J.G. BOYCE
SECT. MGR. L.W. Creswell
DATE COMPL. 9-22-77
EXAMINED —
AUTHORIZED A. Conley
DATE 9-22-77
TECH. APPROVAL NOT REQ'D
CSD APPROVAL R.L. Harrington

HULL 613C

TYPE OF DWG. WORKING DRAWING

TITLE CONTAMINATED STEAM & EXHAUST PIPING ARR UPPER DECK - FWD FR 105 - L/M

DWG. NO. 6450-780 REV D SHEET NO. 1 OF 12

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE	—	—	—	—
B	6 11 4	F-1 & F-3 WAS 6.625 PIPE F-2 & F-4 WAS 8.625 PIPE ABOVE TO SUIT USCG REQUEST. KBD JGB LINE 9 WAS 1", S/M WAS MO 216707 S4,L9 JWS	10/25/77	LWC	1/14/78	SHELL LTR 1943V
C	9 6 8	LINE 17: S/M WAS PO 6450-C9 ⑯ JGB LINES 3 & 4 ADDED LINES 7-9 ADDED JGB JWS	1/8/79	LWC		
D	7	LINES 4,6,8 & 9 ADDED JWS	3/7/79	LWC		

NO.	REFERENCES	DWG. NO.
4	PAINTING SCHEDULE	8300-40
3	PIPE DET CONT. STM EXH PIPING - UPPER DK FWD FR 105	6451-460
2	PIPE DET CONT. STM PIPING - UPPER DK FWD FR 105	6450-677
1	CONT. STEAM & EXHAUST SYS UPPER DK FWD FR 105 ARR	6450-779

HULL NO. 613C & 614C DWG. NO. 6450-780
REVISION D SHEET 2 OF

NOTES:

1. FOR NOTES, REFERENCES, AND ARRANGEMENT OF PIPING, SEE REFERENCE 1.
2. FOR PIPE DETAILS, SEE REFERENCES 2 & 3.
3. ALL PIPE HANGERS TO BE COATED IN ACCORDANCE WITH NOTE 4 ON SHT 12 OF REF. 4.

HULL NO. 613C & 614C DWG. NO. 6450-780
REVISION A SHEET 3 OF

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	P2H	6.625 O.D. X .432 THK, STL, BLK X-HVY, ASTM-A53 TY S, GR B	PMO 6450-677	PS	
A	2	1	P2J				
A	3	1	P2L				
A	4	1	P2M				
A	5	1	P2N	↓	↓		
A	6	24"	P5-1	1.315 O.D. X .179 THK, STL, BLK X-HVY, ASTM-A53, TY S, GR B	K57-07-104		
A	7	6"	P7-3/4	1.050 O.D. X .154 THK, STL, BLK, X-HVY, ASTM-A53, TY S, GR B	K57-07-103	↓	
	8		FITTING NO.				
B	9	1	F-5	3/4" HOSE ADAPTER, ASSY BRASS	MO 283127 S-4B, L-1	ST-PS	
A	10	5	60WS2	6" BACKING RING, STL, AISI-1010 FOR 6.625 O.D. X .432 THK PIPE	97-18-135		
A	11	2	F-6	SUPPORT ASSY FOR SPECIAL HANGER TYPE H60-6	MO 2600-135 S-7Y, L-13	↓	
	12						
	13		VALVE NO.				
A	14	1	V-5001	1" GLOBE STOP VALVE, STL, SW, 600# ASTM-A105 OR A181, GR 1	P.O. 6450-C9 ⑧	MD-PS	
A	15	1	6VS1	3/4" GLOBE STOP VALVE, STL, 600# ASTM-A105 OR A181, GR1	P.O. 6450-C9 ⑥	↓	
	16		HANGER NO.				
A	17	7	H16-6	6" "U-BOLT" - 5/8" DIA. ROD, STL, GALV, W/(4) GALV. HEX NUTS	P.O. 2400-C44 ⑤	MD-PS	
A	18	4	H60-6	6" SPECIAL "U-BOLT" 1/2 DIA. ROD, STL, GALV. W/(4) GALV. HEX NUTS	MO 2600-135 S-7K, L-13	ST-PS	

REMARKS -

SERVICE - CONT. STEAM SYS
FR 105-109 P/S UPPER DK
GROUP NO. 6450-1506-1001-PI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-780 SHEET 4 REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	P2K	6.625 O.D. X .432 THK, STL, BLK, X-HVY, ASTM-A53 TY S, GR B	PMO 6450-677	PS	
A	2	1	P2P	↓			
A	3	1	P4AH	4.500 O.D. X .337 THK, STL, BLK, X-HVY, ASTM-A53 TY S, GR B			
A	4	1	P4AJ				
A	5	1	P4AK				
A	6	1	P4AL				
A	7	1	P4AM				
A	8	1	P4AN				
A	9	1	P4AP				
A	10	1	P4AR				
A	11	1	P4AS				
A	12	1	P4AT				
A	13	1	P4AU				
A	14	1	P4AV				
A	15	1	P4AW				
A	16	1	P4AX				
A	17	1	P4AY				
A	18	1	P4AZ	↓	↓	↓	

REMARKS -

SERVICE - CONT. STM SYS
FR 109 - FWD P/S UPPER DK
GROUP NO. 6450-1805-1001-SI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-780 SHEET 5 REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	0'-12"	P6-1/2	.840 O.D. X .147 THK, STL, BLK, X-HVY, ASTM-A53, TY S, GR B	K57-07-102	PS	
	2						
C	3	9	J-1	4" FLANGE SLIP-ON 300# C. STL ASTM-A105	25-18-518	ST-PS	
C	4	5	F-10	4" Y-STRAINER FLANGED 300# C. STL	P.O. ① 6450-C74	↓	
B	5	1	F-1	ANCHOR 6X6 X 20# H-BEAM STL ABS GR A 24"LG	73-07-104	PS	
B	6	1	F-3	ANCHOR 6X6X20# H-BEAM STL. ABS GRA 29"LG	↓	↓	
A	7	2	60WS2	6" BACKING RING, STL, AISI-1010 FOR 6.625 O.D. X .432 THK PIPE	97-18-135	ST-PS	
A	8	11	40WS2	4" BACKING RING, STL, AISI-1010 FOR 4.500 O.D. X .337 THK PIPE	97-18-106		
A	9	7	F-8	SUPPORT ASSY FOR SPECIAL HANGER TYPE H60-4	MO 2600-135 S-7Y, L-5	↓	
	10						
	11		VALVE NO.				
A	12	1	V-188	4" GATE VALVE, STL, FLG'D, 150# ASTM-A216, GR WCB	P.O. 6451-C3 ㊶	MD-PS	
A	13	1	V-189				
A	14	1	V-190				
A	15	1	V-5056				
A	16	1	V-5057	↓	↓		
A	17	1	V-513P	1/2" GLOBE STOP VALVE, STL, SW, 800# ASTM-A105 OR A181 GR 1	P.O. 6450-C9 ②		
A	18	1	V-513S	↓	↓	↓	

REMARKS -

SERVICE - CONT. STM SYS
FR 109 - FWD P/S UPPER DK
GROUP NO. 6450-1805-1001-SI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-780 SHEET 6 REV. C

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	HANGER NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	7	H60-4	4" SPECIAL "U-BOLT" 1/2" DIA. ROD, STL, GALV. W/(4) GALV. HEX NUTS	MO 2600-135 S-7K, L-5	ST-PS	
A	2	3	H12-4	PIPE HANGER TY12 W/O LINER FOR 4" PIPE DWG. 2600-135	MO 2600-135 S-7G, L-6	↓	
	3		PIPE NO.				
D	4	100'	P8	.675 O.D. X .126 THK PIPE EX-HVY, BLK STL. ASTM-A53	57-07-101	ST-PS	
	5		VALVE NO.				
D	6	25	V-1	3/8" GATE VALVE SCR'D 125 WSP BRONZE	26-08-100	ST-PS	
	7		FITTING NO.				
D	8	25	F-11	1/2 X 3/8 REDUCING BUSHING 150# SCR'D MI GALV	25-05-326	ST-PS	
D	9	25	F-12	3/8" PIPE NIPPLE EX-HVY STL, ASTM-A106 3"LG	25-14-842	↓	
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

PS-MC:190

SERVICE - CONT. STM SYS
FR 109 - FWD P/S UPPER DK
GROUP NO. 6450-1805-1001-SI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-780 SHEET 7 REV. D

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	80	4021	4" 150#	BOLTS	HEX HD HVY, 5/8-11UNC-2A 3 LG	P.O. 6000-C13 ㊾	MD-PS	
A	2	80			NUTS	HEX HVY, 5/8-11UNC-2B	P.O. 6000-C12 ⑱	↓	
A	3	10			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-278E	ST-PS	
A	4	40	①	4" 300#	BOLTS	HEX HD HVY, 3/4-10UNC-2A, 2 1/4 LG	P.O. 6000-C13 ㉗	MD-PS	
A	5	–			NUTS	NOT REQD	–		
A	6	5			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-248E	ST-PS	
C	7	72	4027	4" 300#	BOLTS	3/4-10UNC-2A, 4 3/4 LG STUD	97-63-051	ST-PS	
C	8	144			NUTS	3/4-10UNC-2B HEX HVY	2600-C94 ①		
C	9	10			GSKT	COMPRESSED ASBESTOS	15-01-248E	↓	
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR. B, ZINC PLATE
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

SERVICE - CONT STM SYS
FR 109 - FWD P/S UPPER DK
GROUP NO. 6450-1805-1001-SI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-780 SHEET 8 REV. C

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	1	P1A	8.625 O.D. X .322 THK, STL, BLK, SCH 40, ASTM-A53, TY S, GR B	PMO 6451-460	PS	
A	2	1	P1B				
A	3	1	P1D				
A	4	1	P1E				
A	5	1	P1F	↓	↓		
A	6	6"	P7-3/4"	1.050 O.D. X .154 THK, STL, BLK, SCH 80, ASTM-A53, TY S, GR B	K57-07-103	↓	
	7						
	8		FITTING NO.				
A	9	5	80WS1	8" BACKING RING, STL, AISI-1010 FOR 8.625 O.D. X .322 THK PIPE	97-18-137	ST-PS	
A	10	2	F-7	SUPPORT ASSY FOR SPECIAL HANGER TYPE H60-8	MO 2600-135 S-7Z, L-1	↓	
	11						
	12		HANGER NO.				
A	13	7	H16-8	8" "U-BOLT" 5/8" DIA. ROD, STL, GALV, W/(4) GALV. HEX NUTS	MO 2600-135 S-7AF, L-1	ST-PS	
A	14	4	H60-8	8" SPECIAL "U-BOLT" 5/8" DIA. ROD, STL, GALV., W/(4) GALV. HEX NUTS	MO 2600-135 S-7L, L-1	↓	
	15						
	16		VALVE NO.				
C	17	1	6VS1	3/4" GLOBE STOP VALVE, SW, STL, 600# ASTM-A105, OR A181, GR 1	PO 6450-C9 ⑥	MD-PS	
	18						

REMARKS -

SERVICE - CONT. EXHAUST SYS
FR 105-109 P/S UPPER DK
GROUP NO. 6451-1506-1001-PI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-780 SHEET 9 REV. C

6450-780

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ALEXANDRIA • RICHMOND • NORFOLK
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SEPT. '80

FRAME

8X

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A		1	1	P1C	8.625 O.D. X .322 THK, STL, BLK, SCH 40, ASTM-A53, TY S, GR B	PMO 6451-460	PS	
A		2	1	P1G	↓	↓	↓	
A		3	1	P3R	5.563 O.D. X .258 THK, STL, BLK SCH 40, ASTM-A53, TY S, GR B	↓	↓	
A		4	1	P3S	↓	↓	↓	
A		5	1	P3T	↓	↓	↓	
A		6	1	P3U	↓	↓	↓	
A		7	1	P3V	↓	↓	↓	
A		8	1	P3W	↓	↓	↓	
A		9	1	P3X	↓	↓	↓	
A		10	1	P3Y	↓	↓	↓	
A		11	1	P3Z	↓	↓	↓	
A		12	1	P3AA	↓	↓	↓	
A		13	1	P3AB	↓	↓	↓	
A		14	1	P3AC	↓	↓	↓	
A		15	1	P3AD	↓	↓	↓	
A		16	1	P3AE	↓	↓	↓	
A		17	1	P3AF	↓	↓	↓	
A		18	1	P3AG	↓	↓	↓	

REMARKS -

SERVICE - CONT. EXHAUST SYS
FR 109-FWD P/S UPPER DK

GROUP NO. 6451-1805-1001-SI

APPLICABLE HULLS	613C	614C								DWG NO.	SHEET	REV.
	YES	YES								6450-780	10	A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	1	F-2	ANCHOR 8X8X31 #"H-BEAM STL, ABS GR A 25 LG	73-07-108	PS	
B		2	1	F-4	ANCHOR 8X8X31 #"H-BEAM STL, ABS GR A, 30 LG.	↓	↓	
A		3	2	8OWS1	8" BACKING RING, STL, AISI-1010 FOR 8.625 O.D. X .322 THK PIPE	97-18-137	ST-PS	
A		4	11	5OWS1	5" BACKING RING, STL, AISI-1010 FOR 5.563 O.D. X .258 THK PIPE	97-18-133	↓	
A		5	7	F-9	SUPPORT ASSY FOR SPECIAL HANGER TYPE H60-5	MO 2600-135 S-7Y, L-9	↓	
		6						
		7						
		8		VALVE NO.				
A		9	1	V-291	5" GATE VALVE, STL, FLG'D, 150# ASTM-A216, GR WCB	P.O. 6451-C3 ㉔	MO-PS	
A		10	1	V-292	↓	↓	↓	
A		11	1	V-293	↓	↓	↓	
A		12	1	V-5058	↓	↓	↓	
A		13	1	V-5059	↓	↓	↓	
		14						
		15		HANGER NO.				
A		16	7	H60-5	5" SPECIAL "U-BOLT" ½" DIA. ROD, STL, GALV. W/(4) GALV. HEX NUTS	MO 2600-135 S-7K, L-9	ST-PS	
A		17	3	H12-5	PIPE HANGER TY 12 W/O LINER FOR 5" PIPE DWG 2600-135	MO 2600-135 S-7G, L-11	↓	
		18						

REMARKS -

SERVICE - CONT. EXHAUST SYS
FR 109-FWD P/S UPPER DK

GROUP NO. 6451-1805-1001-SI

APPLICABLE HULLS	613C	614C								DWG NO.	SHEET	REV.
	YES	YES								6450-780	11	B

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	80	50Z1	5" 150#	BOLTS	HEX HD HVY, 3/4-10UNC-2A, 3 LG	P.O. 6000-C13 ㉑	MO-PS	
A	2	80			NUTS	HEX HVY, 3/4-10UNC-2B	P.O. 6000-C12 ⑭	│	
A	3	10			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-280E	ST-PS	
A	4	40	②	6" 150#	BOLTS	HEX HD HVY, 3/4-10 UNC-2A 2 1/4 LG	P.O. 6000-C13 ㉑	MO-PS	
A	5	-			NUTS	NOT REQD	-		
A	6	5			GSKT	COMPRESSED ASBESTOS, 1/16 THK	15-01-282E	ST-PS	
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT.				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -
ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307, GR B, ZINC PLATED
ALL BOLTS TO BE ANSI STD B18.2.1
ALL NUTS TO BE ANSI STD B18.2.2

SERVICE - CONT. EXHAUST SYS
FR 109-FWD P/S UPPER DK.

GROUP NO. 6451-1805-1001-SI

APPLICABLE HULLS	613C	614C								DWG NO.	SHEET	REV.
	YES	YES								6450-780	12	A

6450-780

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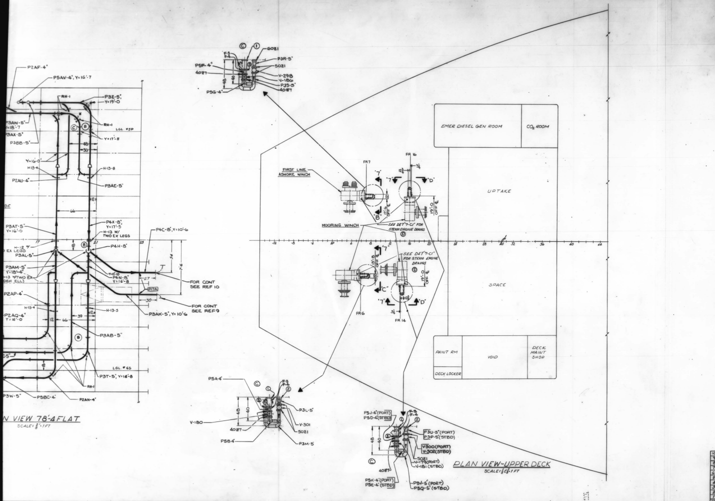
SEPT. '80

FRAME

8X


P2AF-4"
P5AV-4", Y=16'-7
RH-1
P3Z-5", Y=19'-0
P3AW-5", Y=18'-7
P3AX-5"
P3BB-5"
LGL #5P
Y=17'-5
48
30
Y=16'-0
H13-4
H-13-8
P2AU-4"
P3AE-5"
66
P3AT-5", Y=16'-0
P4X-8", Y=17'-5
H-13 W/ TWO EX LEGS
P4C-8", Y=10'-6
H-12 W/ TWO EX LEGS
P4H-8"
P3AL-5"
P3AM-5", Y=18'-4"
H-13 W/ TWO EX (UNDER ELL)
Y=15'-10
P4N-8", Y=16'-8
27
P17A
FOR CONT SEE REF 10
30
FOR CONT SEE REF 9
P2AP-4"
H-13-4
H-13-5
P2AQ-4", Y=16'-0
12
66
39
P3AK-5", Y=10'-6
P3AB-5"
LGL #6S
P3T-5", Y=16'-8
RH-1
P3W-5"
P5BC-4"
P2AN-4"
N VIEW 78'-4 FLAT
SCALE: 3/8"=1 FT
F-3
F-4
6021
P5F-4"
P3R-5"
4027
5021
V-298
V-186
P3S-5"
4027
P5G-4"
FIRST LINE ASHORE WINCH
FR 7
FR 16
"7"
"D"
"B"
17'-6 OFF ℄
19'-0 OFF ℄
MOORING WINCH
SEE DET "7-C1" FOR STEAM ENGINE DRAINS
SEE DET "7-C1" FOR STEAM ENGINE DRAINS
13'-8 OFF ℄
"C"
FR 6
FR 14
EMER DIESEL GEN ROOM
CO2 ROOM
UPTAKE
SPACE
PAINT RM
VOID
DECK MAINT SHOP
DECK LOCKER
P5A-4"
V-180
4027
P5B-4"
P3L-5"
V-301
5021
P3M-5"
48
40
P5J-4" (PORT)
P5D-4" (STBD)
P3U-5" (PORT)
P3P-5" (STBD)
V-300 (PORT)
V-302 (STBD)
5021
V-179 (PORT)
V-181 (STBD)
4027
P5K-4" (PORT)
P5E-4" (STBD)
P3V-5" (PORT)
P3Q-5" (STBD)
PLAN VIEW-UPPER DECK
SCALE: 3/8"=1 FT
5
4
3
2
1

REVISIONS

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTH	OWNER DATE	OWNER APP'D
A	ALL	INITIAL ISSUE				
B	6-D 7-B 5-A,B 5-A,B 5-C ALL 6A,7A 5-B 6-D ALL	PIPES REDRAWN TO CORRECT "Y" DIM. RESCHEMED DRAIN PIPING / ADDED H13-½ STBD EXH. PIPING ALTERED TO AVOID FOULING LONG. # 6S. DETAILS P4X, P3Z / P3AE ALTERED TO AVOID FOULING L # 5P HANGER TYPES ALTERED. (SEE L/M) "P1-½" EXTENDED TO 6" ABOVE DECK. DETAILS P2AR / P3AJ ALTERED TO SUIT EXISTING HOLE CUTS AT FR 9,5 DETAIL P2AH ALTERED TO AVOID FOULING VENT. DUCT. ALL EXH. PIPING CHANGED TO STD. I.P.S. / "P3" PIPE NOS.	3/16/78	LWC		
C	5-C 6-B	DETAILS P3AD-5, P3AE-5 / P3AJ-5 ALTERED TO SUIT PIPE DETAILS				
	—	PLAN VIEW-UPPER DK.: ADDED F-3 F-4 & JOINT IDENT ③ TO STM TO FIRST LINE ASHORE WINCH & MOORING WINCHES. (WORK ACCOMP ON 6-3C.)	1/12/79	LWC		
D		CONDENSATE DRAINS FOR THE MOORING WINCH STEAM ENGINES ADDED. DETAIL "7-C1" ADDED TO SUIT. THIS INCORPORATES LIAISON No. LWC-74.	2/14/79	LWC		

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCES 1 AND 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REF 2 FOR LIST OF ACCEPTANCE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. AND REF 3.
4. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
5. PAINTING IS TO BE IN ACCORDANCE WITH REFERENCE 5.
6. TEST ARE TO BE IN ACCORDANCE WITH REFERENCE 2.
7. INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REFERENCE 4.
8. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT. "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
9. ALL DECK STEAM PIPING ON THIS DRAWING IS CLASS I. ALL DECK EXHAUST PIPING ON THIS DRAWING IS CLASS I.
10. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS: BUTT WELDS TYPE P-3, SOCKET WELDS TYPE P-14 AND FLANGE WELDS TYPE P-16A ON REFERENCE 3 EXCEPT AS OTHERWISE INDICATED.
11. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
12. ALL HOLE CUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.
13. BACKING RINGS AND COUPLINGS SHOWN IN LIST OF MATERIAL ARE TO BE USED AS REQUIRED.

FOR LIST OF MATERIAL SEE REF 8

DWG. REV. — HULL APPLIC

REV	NN HULLS ONLY					
A	YES	YES				
B	YES	YES				
C	YES	YES				
D	NO	YES				

REPRODUCTION OFFICE

YARD PRINTS YES GROUPING —

REMARKS Rev "D"

DATE 2-14-79 SIGNED L.W. Caswell

GROUP:
MC NO.

N N S & D D CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS

OWNERS	ABS
LTR NN/ANK DTD 4-14-77	LTR DTD 7-1-77
	USCG LTR. SER. 4077 DTD 5-4-77

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING DEPT.

INSTALLATION GROUPS:
6450-0405-1001
6451-0405-1001

SCALE 3/8 · 1 · 1½ = 1 FT
DRAWN Randy Walters
CHECKED E.W. Kelly
SECT MGR L.W. Caswell
DATE COMPL. 3-11-77
EXAMINED
AUTHORIZED E.T. Stephenson
DATE 3-11-77

TECH APPROVAL E.T. PRINT DATED 3-8-77
CSD APPROVAL R.L. Hennigh

NO.	REFERENCES	DWG NO.
10	PIPING ARR DK MACHY EXH IN ENG ROOM	6451-485
9	PIPING ARR 220 PSI CONTAM STM SYS	6450-705
8	CONT STM & EXH PIPING ARR UPPER DK AFT FR 44 L/M	6450-785
7	CONT EXH PIPING ARR UPPER DK AFT FR 44 PIPE DETAILS	6451-456
6	CONT STM PIPING ARR UPPER DK AFT FR 44 PIPE DETAILS	6450-673
5	PAINTING SCHEDULE	8300-40
4	DIRECTIONS FOR INSULATING & LAGGING PIPE	257322
3	FABRICATION & WELDING INSTRUCTIONS-CL I & II PIPING	257033
2	DIAG CONT STEAM GEN SYS L/M	6450-693
1	DIAG CONT STEAM GEN SYS ARR	6450-692

CONTAMINATED STEAM AND EXHAUST PIPING-UPPER DECK AFT FR 44 ARR

USMA DESIGN 711-3-1168
USMA DWG NO.
HULL NO.

DWG NO. 6450-784 REV D SHEET NO. 1 OF 1

6450-784

MICRO-MASTER 105 mm
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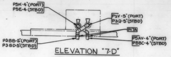
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 1

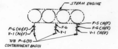


P5K-4"(PORT)
P5E-4(STBD)
P3V-5"(PORT)
P3Q-5"(STBD)
P1-1A
P3BB-5"(PORT)
P3BD-5"(STBD)
P5AV-4"(PORT)
P5BC-4"(STBD)

ELEVATION "7-D"

PORT LKG INBD, STBD SIDE SIM

SCALE: 3/8"=1'-0

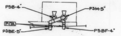


STEAM ENGINE
F-6 (N+F)
V-1 (N+F)
F-6
V-1
F-5 (N+F)
F-6 (N+F)
V-1 (N+F)
3/8 P-6(TO
CONTAINMENT BASIN

DETAIL "7-C1"

SHOWING TYPICAL STEAM ENGINE CONDENSATE DRAINS

NTS

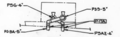


P5B-4"
P3M-5"
P1-1A
P3BE-5"
P3BF-4"

SECTION "7-C"

FR 10 LKG AFT

SCALE: 3/8"=1'-0

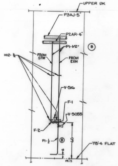


P5G-4"
P3S-5"
P1-1A
P3BA-5"
P5AZ-4"

SECTION "7-B"

FR 10 LKG AFT

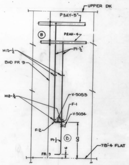
SCALE: 3/8"=1'-0



UPPER DK
P3AJ-5"
P2AR-4"
P1-1/2"
B
H12-1/2
FROM STM
FROM EXH
V-516
F-1
V-5055
F-2
P1-1/2
B
78'-4 FLAT
FR 13

ELEVATION "7-A"

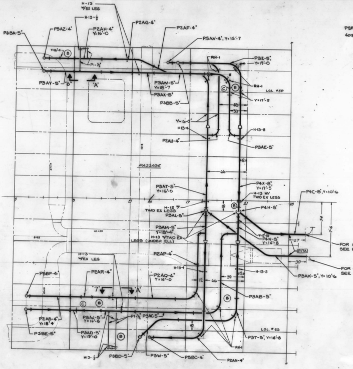
SCALE: 3/8"=1'-0



UPPER DK
P3AY-5"
B
P2AH-4
B
H12-1/2
P1-1/2"
BHD FR 9
H12-1/2
V-5053
F-1
V-5054
F-2
P1-1/2
B
78'-4 FLAT
FR 9

ELEVATION "6-A"

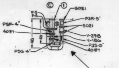
SCALE: 3/8"=1'-0



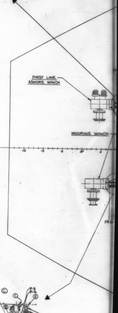
H-13
W/EX LEG
H13-1/2
P3BA-5"
P5AZ-4"
P2AH-4"
Y=16'-0
P2AG-4"
P2AF-4"
P5AV-4", Y=16'-7
RH-1
P3Z-5"
Y=19'-0
P1-1/2
P3AY-5"
"6"
"A"
P3AW-5"
Y=18'-7
P3AX-5"
P3BB-5"
RH-1
LGL #5P
Y=17'-8
Y=16'-0
H13-4
H-13-8
P2AU-4"
P3AE-5"
PASSAGE
66
P3AT-5"
Y=16'-0
P4X-8"
Y=17'-5
H-13 W/
TWO EX LEGS
P4C-8", Y=10'-6
H-12 W/
TWO EX LEGS
P3AL-5"
P4H-8"
P3AM-5"
Y=18'-4
H-13 W/TWO EX
LEGS (UNDER ELL)
P4N-8"
Y=16'-8
P1-1A
FOR CONT
SEE REF 10
H-13
W/EX LEG
P2AP-4"
H13-4
H-13-5
P3BF-4"
P2AR-4"
P2AQ-4"
Y=16'-0
P3AK-5", Y=10'-6
FOR CONT
SEE REF 9
"7"
"A"
P3AB-5"
P2AS-4"
Y=18'4
P3AJ-5"
Y=16'-8
P1-1/2
P3AC-5"
P3AD-5"
Y=19'-0
LGL #6S
P3BE-5"
P3T-5", Y=16'-8
RH-1
H13-1/2
P3BD-5"
P3W-5"
P5BC-4"
P2AN-4"

PLAN VIEW 78'-4 FLAT

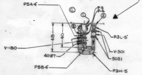
SCALE: 3/8"=1FT



C
1
6021
P5F-4"
P3R-5"
4027
5021
V-298
V-186
P3S-5"
4027
P5G-4"
48
40



FIRST LINE
ASHORE WINCH
MOORING WINCH



P5A-4"
C
1
2
P3L-5"
48
40
V-180
V-301
4027
5021
P5B-4"
P3M-5"

6450-784

MICRO-MASTER 105 mm

K+E

ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 2

6450-785

CSD VAULT

E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS PARTIAL ISSUE FOR REV "D"
GROUPING YES
DATE 2-14-79
SIGNED L.W. Craswell

YARD PRINTS | ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS													
REV.	D	D	A	A	A	B	D	C	B	B	B	A
SHEET	1	2	3	4	5	6	7	8	9	10	11	12

GROUP
MC NO.

DWG. REV. — HULL APPLIC.

REV.	613C	614C
A	YES	YES
B	YES	YES
C	YES	YES
D	NO	YES

NNS&DDCO HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C	310	↑	
613C	309	TII-S-116A	

APPROVALS
OWNERS LTR NNI611V DTD 4-14-7
ABS LTR DTD 7-1-77
USCG LTR. SER 4077 DTD 5-4-77

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
DEPT. COMMERCIAL SHIP ENGRG

SCALE NONE =1 Ft.
DRAWN W.F. HOGGE
CHECKED E.W.Kelly
SECT. MGR. L.W. Craswell
DATE COMPL. 3-11-77
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 3-11-77
TECH. APPROVAL NOT REQ'D
CSD APPROVAL

HULL 613C | KEY | GROUP NO. | PART | COMP. | BY | CHK.
GROUPED | DATES

TYPE OF DWG. WORKING DRAWING

TITLE
PIPING ARR-CONTAMINATED STEAM & EXHAUST AFT FR44 L/M

DWG. NO. 6450-785 REV D SHEET NO. 1 OF 12

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D.	OWNER DATE	OWNER APPD.
A	—	INITIAL ISSUE				
B	9	LINES 16,17 & 18 CHANGED MAT'L DESCRIPTION FROM X-HVY TO STD. & PIPE NOS. TO "P6".				
	10	LINES 1-9 CHANGED MAT'L DESCRIPTION FROM X-HVY TO STD. & PIPE NOS. TO "P6".				
		LINE 15 QTY WAS 14				
		LINE 16 DELETED				
	6	LINE 9 HGR TYPE WAS H-11, QTY WAS 2				
		LINE 10 ↓ ↓ ↓ ↓				
		LINE 11 ↓ ↓ ↓ ↓, QTY WAS 10				
		LINE 14 QTY WAS 1				
		LINE 15 HGR TYPE WAS H-57, SOURCE ALTERED.				
		LINES 16-18 ADDED.				
		LINES 9,10,12,13/14 SRC ADDED FOR SUP. LEG				
	11	LINE 9 HGR TYPE WAS H-11. SUP. LEG SRC ADDED				
		LINE 10 ↓ ↓				
		LINE 11 SUP. LEG SRC ADDED				
		LINE 12 ↓				
		LINE 13 HGR TYPE WAS H-57. QTY WAS 4. SRC ALT.				
		LINES 14,15/16 ADDED AES JGB	3/16/78	LWC		
C	7 8	ADDED L'S 8&9. (WORK ACCORD ON) ADDED L'S 7,8&9. (613C.	1/12/79	LWC		
D	7	LINES 2,10&11 ADDED JWS	3/4/79	LWC		

NO.	REFERENCES	DWG. NO.
3	PIPE DETAILS-CONT EXHAUST AFT FR 44	6451-456
2	PIPE DETAILS-CONT STEAM AFT FR 44	6450-673
1	PIPING ARR-CONT STEAM & EXHAUST AFT FR 44	6450-784

HULL NO. 613C & 614C DWG. NO. 6450-784 REV D SHEET 2 OF 12

NOTES:

1. FOR ADDITIONAL NOTES & REFERENCES SEE REF NO. 1.

HULL NO. 613C & 614C DWG. NO. 6450-785 REV A SHEET 3 OF 12

GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A		1	1	P5A	4.50 O.D. x .337 THK STL, ASTM-A53, GR-B, X-HVY	PMO 6450-673	PS	
A		2	1	P5B	↓	↓	↓	
A		3	1	P5D	↓	↓	↓	
A		4	1	P5E	↓	↓	↓	
A		5	1	P5F	↓	↓	↓	
A		6	1	P5G	↓	↓	↓	
A		7	1	P5J	↓	↓	↓	
A		8	1	P5K	↓	↓	↓	
A		9	1	P5AV	↓	↓	↓	
A		10	1	P5AZ	↓	↓	↓	
A		11	1	P5BC	↓	↓	↓	
A		12	1	P5BF	↓	↓	↓	
A		13	1	P2AF	4.50 O.D. x .237 THK STL, ASTM-A53, GR-B, STD	↓	↓	
A		14	1	P2AG	↓	↓	↓	
A		15	1	P2AH	↓	↓	↓	
A		16	1	P2AN	↓	↓	↓	
A		17	1	P2AP	↓	↓	↓	
A		18	1	P2AQ	↓	↓	↓	

REMARKS -

SERVICE - CONTAM ST TO AFT DK MACHY ABV 78'-4 FLAT FR 5-23
PS-152
GROUP NO. 6450-0405-1001-PI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-785 SHEET 4 REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A		1	1	P2AR	4.50 O.D. x .237 THK STL, ASTM-A53, GR-B	PMO 6450-673	PS	
A		2	1	P2AS	↓	↓	↓	
A		3	1	P2AU	↓	↓	↓	
A		4	1	P3AK	5.563 O.D. x .258 THK STL, ASTM-A53, GR B	↓	↓	
A		5	1	P3AL	↓	↓	↓	
A		6	1	P3AM	↓	↓	↓	
A		7	1	P3AT	↓	↓	↓	
		8						
		9						
		10						
		11		FITTING NO.				
A		12	3	50WS1	5" BACKING RING, ASTM-A109, STL, FOR 5.563 O.D. x .258 THK PIPE	97-18-133	ST-PS	
A		13	13	40WS1	4" BACKING RING, ASTM-A109, STL, FOR 4.50 O.D. x .237 THK PIPE	97-18-131	↓	
A		14	4	40WS2	4" BACKING RING, ASTM-A109, STL, FOR 4.50 O.D. x .337 THK PIPE	97-18-106	↓	
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - CONTAM ST TO AFT DK MACHY ABV 78'-4 FLAT FR 5-23
PS-152
GROUP NO. 6450-0405-1001-PI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-785 SHEET 5 REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	VALVE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A		1	1	V-179	4" GATE VLV, FLG'D, STL ASTM-A216, GR WCB	㊶ 6451-C3	MD-PS	
A		2	1	V-180	↓	↓	↓	
A		3	1	V-181	↓	↓	↓	
A		4	1	V-186	↓	↓	↓	
		5						
		6						
		7						
		8		HANGER NO.				
B		9	1	H-12	5" SWING TYPE HGR W/TWO EX LEGS & 1/4 LINER	25-47-426 & 25-50-618	ST-PS	
B		10	2	H-13	4" SWING TYPE HGR W/ONE EX LEG & 1/4 LINER	25-48-416 & 25-50-617	↓	
B		11	8	H-12	1/2" SWING TYPE HGR W/1/4 LINER	25-47-326	↓	
B		12	1	H-13	4" SWING TYPE HGR W/1/4 LINER	25-48-416 & 25-50-614	↓	
B		13	1	H-13	5" SWING TYPE HGR W/1/4 LINER	25-48-426 & 25-50-623	↓	
B		14	4	H-13	1/2" SWING TYPE HGR W/1/4 LINER	25-48-326 & 25-50-605	↓	
B		15	2	RH-1	4" ROD TYPE HGR W/1/4 LINER	M.O. 283124 S-GJ, L-1	—	
B		16	1	H-13	5" SWING TYPE HGR W/ TWO EX LEGS & 1/4 LINER	25-48-426 & 25-50-620	ST-PS	
B		17	1	RH-1	4" ROD TYPE HGR W/1/4 LINER	M.O. 283124 S-6K, L-7	↓	
B		18	1	RH-1	↓	M.O. 283124 S-6K, L-1	↓	

REMARKS -

SERVICE - CONTAM ST TO AFT DK MACHY ABV 78'-4 FLAT FR 5-23
PS-152
GROUP NO. 6450-0405-1001-PI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-785 SHEET 6 REV. B

GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A		1	75'-0	P1	.840 O.D. x .147 THK STL, ASTM-A53, GR B	K57-07-102	PS	
D		2	60'-0	P-6	.675 O.D. X .126 THK PIPE EX HVY, BLK STL ASTM-A53	57-07-101	PS	
		3						
		4						
		5		FITTING NO.				
A		6	2	F-1	1/2" TEE, STL, 3000# ASTM-A181, GR-B, SW	⑩ 6200-C12	MD-PS	
A		7	2	F-2	1/2" ELL 90°, SW, STL 3000# ASTM-A181 GR B	25-60-006	ST-PS	
C		8	4	F-3	4" Y-STRAINER STL 300# FLG'D	PO ① 6450-C74	↓	
C		9	4	F-4	4" SLIP-ON FLG 300# STL	S/ 2518-518	↓	
D		10	8	F-5	1/2 X 3/8 REDUCING BUSHING 150# SCR'D M.I. GALV	25-05-326	ST-PS	
D		11	20	F-6	3/8" PIPE NIPPLE EX-HVY STL, ASTM-A106 3" LG	25-14-842	↓	
		12						
		13		VALVE NO.				
A		14	1	V-516	1/2" GLOBE STOP, STL, ASTM-A105, SW	② 6450-C9	MD-PS	
A		15	1	V-5053	↓	↓	↓	
A		16	1	V-5054	↓	↓	↓	
A		17	1	V-5055	↓	↓	↓	
D		18	4	V-1	3/8 GATE VALVE SCR'D 125# WSP	26-08-100		

REMARKS -

SERVICE - CONTAM ST TO AFT DK MACHY ABV 78'-4 FLAT FR 5-23
PS-152
GROUP NO. 6450-0405-1001-PI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-785 SHEET 7 REV. D

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	72	40Z7	4" 300#	BOLTS	3/4 10UNC-2A, 4 1/4 LG, HEX HD HVY	5316000-C7 ㊿	MD-PS	
A	2	72			NUTS	3/4 10 UNC-2B, HEX HVY	5316000-C12 ㉑		
A	3	9			GSKT	1/16 THK COMP ASBESTOS	6000-C12 ⑭ 15-01-248E	ST-PS	
A	4	24	①	4" 300#	BOLTS	3/4 10UNC-2A, 2 1/4 LG, HEX HD HVY	2600-C38 (68)	MD-PS	
A	5	—			NUTS	—	—		
A	6	3			GSKT	1/16 THK COMP ASBESTOS	15-01-248E	ST-PS	
C	7	32	③	4" 300#	BOLTS	3/4" BOLT STUD STL L=4 1/2	21-18-568	↓	
C	8	64			NUTS	3/4 HVY HEX STL	21-31-104	↓	
C	9	4			GSKT	1/16 Comp Asbestos	15-01-248	↓	
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307 GR B, ZINC PLATED
ALL BOLTS TO BE ANSI B18.2.1
ALL NUTS TO BE ANSI B18.2.2

SERVICE - CONTAM ST TO AFT DK MACHY ABV 78'-4 FLAT FR 5-23
PS-152
GROUP NO. 6450-0405-1001-PI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-785 SHEET 8 REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A		1	1	P4C	8.625 O.D. x .322 THK STL ASTM-A53, GR-B, STD	PMO 6451-456	PS	
A		2	1	P4H	↓	↓	↓	
A		3	1	P4N	↓	↓	↓	
A		4	1	P4X	↓	↓	↓	
A		5	1	P3T	5.563 O.D. x .258 THK STL, ASTM-A53, GR-B, STD	↓	↓	
A		6	1	P3W	↓	↓	↓	
A		7	1	P3Z	↓	↓	↓	
A		8	1	P3AB	↓	↓	↓	
A		9	1	P3AC	↓	↓	↓	
A		10	1	P3AD	↓	↓	↓	
A		11	1	P3AE	↓	↓	↓	
A		12	1	P3AJ	↓	↓	↓	
A		13	1	P3AW	↓	↓	↓	
A		14	1	P3AX	↓	↓	↓	
A		15	1	P3AY	↓	↓	↓	
B		16	1	P3L	↓	↓	↓	
B		17	1	P3M	↓	↓	↓	
B		18	1	P3P	↓	↓	↓	

REMARKS -

SERVICE - EXHAUST SYS FROM AFT DK MACHY ABV 78'-4 FLAT FR 5-23
PS-152
GROUP NO. 6451-0405-1001-PI
APPLICABLE HULLS 613C YES 614C YES
DWG NO. 6450-785 SHEET 9 REV. B

6450-785

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

6450-785

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
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SEPT. '80
FRAME
8X

GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	1	P3Q	5.563 O.D. x .258 THK STL, ASTM-A53, GR B, STD.	PMO 6451-456	PS	
B		2	1	P3R	↓	↓		
B		3	1	P3S				
B		4	1	P3U				
B		5	1	P3V				
B		6	1	P3BA				
B		7	1	P3BB				
B		8	1	P3BD				
B		9	1	P3BE	↓	↓		
		10						
		11						
		12						
		13		FITTING				
A		14	3	80WS1	8" BACKING RING, ASTM-A109, STL, FOR 8.625 O.D. x .322 THK PIPE	97-18-137	ST-PS	
B		15	19	50WS1	5" BACKING RING, ASTM-A109, STL, FOR 5.563 O.D. x .258 THK PIPE	97-18-133		
B		16	4	50WS2	~~5" BACKING RING, ASTM-A109, STL, FOR 5.563 O.D. x .375 THK PIPE~~	97-18-107		
		17						
		18						

REMARKS -

PS-152

SERVICE - EXHAUST SYS FROM AFT DK MACHY ABV 78'-4 FLAT FR 5-23

GROUP NO. 6451-0405-1001-PI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	YES	YES	6450-785	10	B

GROUP

REV.		LINE NO.	QTY (1 SHIP)	VALVE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A		1	1	V-298	5" GATE VLV, FLG'D, STL, ASTM-A216, GR WCB	㉔ 6451-C3	MD-PS	
A		2	1	V-300	↓	↓		
A		3	1	V-301				
A		4	1	V-302	↓	↓		
		5						
		6						
		7						
		8		HANGER NO.				
B		9	2	H-13	8" SWING TYPE HGR W/TWO EX LEGS & 1/4 LINER	25-48-446 / 25-50-628	ST-PS	
B		10	1	H-13	5" SWING TYPE HGR W/ONE EX LEG & 1/4 LINER	25-48-426 / 25-50-618		
B		11	1	H-13	8" SWING TYPE HGR W/ 1/4 LINER	25-48-446 / 25-50-626		
B		12	1	H-13	5" SWING TYPE HGR W/ 1/4 LINER	25-48-426 / 25-50-618		
B		13	2	RH-1	5" ROD TYPE HGR W/ 1/4 LINER	M.O. 283124 S-6K, LN-13	—	
B		14	1	RH-1	5" ROD TYPE HGR (EX SHORT) W/ 1/4 LINER	M.O. 283124 S-6J, LN-7	ST-PS	
B		15	1	RH-1	5" ROD TYPE HGR W/ 1/4 LINER	MO 283124 S-6J, L-13		
B		16	1	H-13	5" SWING TYPE HGR W/ONE EX LEG / 1/4 LINER	25-48-426 / 25-50-622	↓	
		17						
		18						

REMARKS -

PS-152

SERVICE - EXHAUST SYS FROM AFT DK MACHY ABV 78'-4 FLAT FR 5-23

GROUP NO. 6451-0405-1001-PI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	YES	YES	6450-785	11	B

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
A	1	64	50W1	5" 150#	BOLTS	3/4-10UNC-2A, 3"LG, HEX HD HVY	6000-C13 ㉑	MD-PS	
A	2	64			NUTS	3/4-10UNC-2B, HEX HVY	6000-C12 ⑭		
A	3	8			GSKT	1/16 THK COMP ASBESTOS	15-01-280E	ST-PS	
A	4	8	60W1	6" 150#	BOLTS	3/4-10UNC-2A, 3 1/4"LG, HEX HD HVY	6000-C7 ㉑	MD-PS	
A	5	8			NUTS	3/4-10UNC-2B, HEX HVY	6000-C12 ⑭		
A	6	1			GSKT	1/16" THK COMP ASBESTOS	15-01-282E	ST-PS	
A	7	24	②	6" 150#	BOLTS	3/4 10UNC-2A, 2"LG, HEX HD HVY	60BC 2613-044 ⑫	MD-PS	
A	8	—			NUTS	—	—		
A	9	3			GSKT	1/16" COMP ASBESTOS	15-01-282E	ST-PS	
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS - ALL BOLTS & NUTS TO BE AMERICAN STD HVY, ASTM-A307
GR B, ZINC PLATED.
ALL BOLTS TO BE ANSI B18.2.1
ALL NUTS TO BE ANSI B18.2.2

PS-152

SERVICE - EXHAUST SYS FROM AFT DK MACHY ABV 78'-4 FLAT FR 5-23

GROUP NO. 6451-0405-1001-PI

APPLICABLE HULLS	613C	614C	DWG NO.	SHEET	REV.
	YES	YES	6450-785	12	A

WELD JOINT INDEX
NN 190-2 (REV. 1)

JOINT MAP DWG. NO. — ARR. DWG. NO. 6450-773 — DETAIL DWG. NO. 6450-674 — INDEX DWG. NO. 6450-835 — REV. A

LINE	WELD IDENTIFICATION	MATL	JOINT NOM SIZE	JOINT WALL THK	JOINT TYPE	WELD PROCEDURE	ROOT PASS PT/SX	ROOT PASS MT/SX	FINAL WELD VT	FINAL WELD PT	FINAL WELD MT	FINAL WELD RT	POST WELD HEAT TREATMENT	NN 45-5 SERIAL NUMBERS 1ST	2ND	3RD	4TH	REMARKS	REV.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	CS-P5N-A	C-STL	8"	.500	P3	W301	NA/NA	NA/NA	NA		NA	NA	NA					SEE NOTE 3	C
2	CS-P5P-A	C-STL	8"	.500	P3	W301	NA/NA	NA/NA	NA	NA	NA		NA					*	
3	CS-P5P-B	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						
4	CS-P5R-A	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					*	
5	CS-P5R-B	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						
6	CS-P5S-A	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					*	
7	CS-P5S-B	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						
8	CS-P5U-A	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					*	
9	CS-P5U-B	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						
10	CS-P5U-C	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						
11	CS-P5V-A	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					*	
12	CS-P5V-B	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						
13	CS-P5V-C	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						
14	CS-P5W-A	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					*	
15	CS-P5W-B	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						
16	CS-P5Y-A	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					*	
17	CS-P5Y-B	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						
18	CS-P5Z-A	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					*	
19	CS-P5Z-B	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN — SYSTEM CONT. STM-UP DK-FR 58-73 — COMPARTMENT — HULL 613C 614C — NAVSHIPS DRAWING NO. — REV. C — SHEET 3

WELD JOINT INDEX
NN 190-2 (REV. 1)

JOINT MAP DWG. NO. — ARR. DWG. NO. 6450-773 — DETAIL DWG. NO. 6450-674 — INDEX DWG. NO. 6450-835 — REV. D

LINE	WELD IDENTIFICATION	MATL	JOINT NOM SIZE	JOINT WALL THK	JOINT TYPE	WELD PROCEDURE	ROOT PASS PT/SX	ROOT PASS MT/SX	FINAL WELD VT	FINAL WELD PT	FINAL WELD MT	FINAL WELD RT	POST WELD HEAT TREATMENT	NN 45-5 SERIAL NUMBERS 1ST	2ND	3RD	4TH	REMARKS	REV.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	CS-P5AA-B	C-STL	8	.500	P3	W301	NA/NA	NA/NA	NA	NA	NA		NA					614C ONLY	D
2	CS-P5S-C	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					↓ ↓ *	E
3	CS-P5W-C	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					↓ ↓ *	E
4																			
5																			
6																			
7																			
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19																			

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN — SYSTEM CONT. STM. UPPER DK. FR 58-73 — COMPARTMENT — HULL 614C ONLY — NAVSHIPS DRAWING NO. — REV. E — SHEET 6

PIPING WELD INDEX TABULATION
FORM 586

REV.	IDENTIFICATION SHT. NO.	IDENTIFICATION LINE NO.	DESCRIPTION	DATE	APP'D.
A	-	-	INITIAL ISSUE JCB	—	—
B	5	—	ADDED (APPLICABLE TO H613C ONLY) MED	7/7/78	LWC
C	1 3	- 1	NOTE 3 MODIFIED JOINT No. CS-P5N-A. WAS R.T. JWS	11/28/78	LWC
D	6	1	ADDED TO SUIT SHOP LIAISON 614C-32, FOR 614C ONLY. JGB	2/26/79	JGB
E	6	2&3	ADDED TO SUIT X-42 REQUEST, H-614C ONLY JWS	5/9/79	LWC

HULL NO. 613C, 614C — DWG. NO. 6450-835 — SHEET NO. 2 — REV. E

WELD JOINT INDEX
NN 190-2 (REV. 1)

JOINT MAP DWG. NO. — ARR. DWG. NO. 6450-773 — DETAIL DWG. NO. 6450-674 — INDEX DWG. NO. 6450-835 — REV. B

LINE	WELD IDENTIFICATION	MATL	JOINT NOM SIZE	JOINT WALL THK	JOINT TYPE	WELD PROCEDURE	ROOT PASS PT/SX	ROOT PASS MT/SX	FINAL WELD VT	FINAL WELD PT	FINAL WELD MT	FINAL WELD RT	POST WELD HEAT TREATMENT	NN 45-5 SERIAL NUMBERS 1ST	2ND	3RD	4TH	REMARKS	REV.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	CS-P5U-D	C-STL	8"	.500	P3	W301	NA/NA	NA/NA	NA	NA	NA		NA					*	B
2	CS-P5U-E	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					*	B
3																			
4																			
5																			
6																			
7																			
8																			
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13																			
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16																			
17																			
18																			
19																			

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN — SYSTEM CONT. STM.-UPP DK.-FR 58-73 — COMPARTMENT — HULL 613C — NAVSHIPS DRAWING NO. — REV. B — SHEET 5

0-835 CSD Vau

ELD INDEX TABULATION
FORM 585

REPRODUCTION SECTION

YARD PRINTS: YES
GROUPING: No
PRINTS: 1-LWC, 1-CSD-V, 1-K50 Ro/SEPIA
REMARKS:
DATE: 2-26-79
SIGNED: L.W. Croswell

9-27-77 LWC CSD-V K50 8PS 4PF 3 X03 Ro/SEPIA 7-18-78 LWC CSD-V K50 8PF 12PS 3 X03 Ro/sepia	12-5-78 LWC CSD-V K50 12PS 2 061A 3 X03 Ro/sepia 3-7-79 LWC CSD-V K50 061A 6PS 2 X03 Ro/sepia	5-15-79 LWC CSD-V K50 061A 12PS 2 X03 Ro/sepia					

GENERAL NOTES

1. PIPING WELDED JOINTS ARE TO BE FABRICATED IN ACCORDANCE WITH NN DWG 257035.
2. ASTERISK (*) IN REMARKS COLUMN DENOTES WELD JOINTS MADE ON THE SHIP AND ARE INDICATED ON THE BODY OF THE PIPING ARRANGEMENT.
3. WELD JOINT NO. CS-PN5-A TO BE FABRICATED IN SHOP AND PT'D ON SHIP. Ⓒ

REF. DWGS.
6450-773 - PIPING ARR - CONT. STM & EXH - UP DK - FR 58-73
6450-674 - PIPE DETS - CONT STM - UP DK - FOR ARR DWG 6450-773

VESSEL IDENTIFICATION NO. — HULL: 614C, 613C

DRAWN BY: J.C. BUNCH
CHECKED BY: JG BOYCE
SUPERVISOR: L.W. Croswell
APPROVED: A. Conley 4/22/77
R.L. Harrington
DESIGN DIV.: COMMERCIAL SHIP
DEPT.: COMMERCIAL SHIP ENG
TITLE: WELD INDEX TABULATION FOR CONT. STM-UP DK FR58-73
N.N. DWG. NO. 6450-835 — REV. E
CASE — DRAWER — VAULT — SHEET 1 OF 6

WELD JOINT INDEX
NN 190-2 (REV. 1)

JOINT MAP DWG. NO. — ARR. DWG. NO. 6450-773 — DETAIL DWG. NO. 6450-674 — INDEX DWG. NO. 6450-835 — REV. A

LINE	WELD IDENTIFICATION	MATL	JOINT NOM SIZE	JOINT WALL THK	JOINT TYPE	WELD PROCEDURE	ROOT PASS PT/SX	ROOT PASS MT/SX	FINAL WELD VT	FINAL WELD PT	FINAL WELD MT	FINAL WELD RT	POST WELD HEAT TREATMENT	NN 45-5 SERIAL NUMBERS 1ST	2ND	3RD	4TH	REMARKS	REV.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	CS-P5AA-A	C-STL	8"	.500	P3	W301	NA/NA	NA/NA	NA	NA	NA		NA					*	
2	CS-P5AB-A	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					*	
3	CS-P5AC-A	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					*	
4	CS-P5AC-B	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						
5																			
6																			
7																			
8																			
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14																			
15																			
16																			
17																			
18																			
19																			

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN — SYSTEM CONT STM-UP DK-FR 58-73 — COMPARTMENT — HULL 613C 614C — NAVSHIPS DRAWING NO. — REV. A — SHEET 4

6450-835

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ALEXANDRIA • RICHMOND • NORFOLK
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SEPT. '80
FRAME
8X

WELD JOINT INDEX
NN 198-2 (REV. 1)

JOINT MAP DWG. NO.
ARR. DWG. NO. 6450-775
DETAIL DWG. NO. 6450-675
INDEX DWG. NO. 6450-836
REV. B

LINE	WELD IDENTIFICATION (1)	MATL (2)	JOINT NOM SIZE (3)	JOINT WALL THK (4)	JOINT TYPE (5)	WELD PROCEDURE (6)	ROOT PASS PT/SX (7)	ROOT PASS MT/SX (8)	FINAL WELD VT (9)	FINAL WELD PT (10)	FINAL WELD MT (11)	FINAL WELD RT (12)	POST WELD HEAT TREATMENT (13)	NN 45-5 SERIAL NUMBERS 1ST (14)	2ND (15)	3RD (16)	4TH (17)	REMARKS (18)	REV. (19)
1	CSI-P2A-A	C-STL	8"	.500	P3	W301	NA/NA	NA/NA	NA	NA	NA		NA					*	
2	CSI-P2A-B																		
3	CSI-P2E-A																	*	
4	CSI-P2E-B																		
5	CSI-P2F-A																	*	
6	CSI-P2F-B																		
7	CSI-P2G-A																	*	
8	CSI-P2G-B																		
9	CSI-P2H-A																	*	
10	CSI-P2H-B																		
11	CSI-P2J-A																	*	
12	CSI-P2J-B																		
13	CSI-P2K-A																	*	
14	CSI-P2K-B																		
15	CSI-P2L-A																	*	
16	CSI-P2L-B																		
17	CSI-P2M-A																	*	
18	CSI-P2M-B																	*H613C ONLY	B
19	CSI-P2G-C	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM: CONT. STM-UP DK ~ FR 73-89
COMPARTMENT
HULL 613C 614C
NAVSHIPS DRAWING NO.
REV. B
SHEET 3

PIPING WELD INDEX TABULATION
FORM 596

REV.	IDENTIFICATION SHT. NO.	IDENTIFICATION LINE NO.	DESCRIPTION	DATE	APP'D.
A	-	-	INITIAL ISSUE JCB	—	—
B	3 4	19 —	ADDED (APPLICABLE TO H-613 ONLY) ADDED ↓ ↓ ↓ ↓ JGB JWS	10/31/78	LWC

HULL NO. 613C, 614C
DWG. NO. 6450-836
SHEET NO. 2
REV. B

6450-836
CSD VAULT

WELD INDEX TABULATION
FORM 595

REPRODUCTION SECTION
YARD PRINTS: YES
GROUPING: No
PRINTS: 1. LWC, 1-CSD-V, 1-KSO, RO/SEPIA
REMARKS: REV. "B"
DATE: 11-1-78
SIGNED: L.W. Creswell

9-27-77 LWC CSD-V KSO 8 PS 3 PF 3 x 3 RO/SEPIA	11-7-78 LWC CSD-V KSO 2-11 12 PS 3 x 3 RO/SEPIA						

GENERAL NOTES
1. PIPING WELDED JOINTS ARE TO BE FABRICATED IN ACCORDANCE WITH NN DWG 257085.
2. ASTERISK (*) IN REMARKS COLUMN DENOTES WELD JOINTS MADE ON THE SHIP AND ARE INDICATED ON THE BODY OF THE PIPING ARRANGEMENT.

REF. DWGS.
6450-775 PIPING ARR- CONT. STM & EXH.- UP. DK- FR 73-89
6450-675 PIPE DET- CONT. STM. PIPING FOR ARR. 6450-775

		HULL
		614C
		613C

VESSEL IDENTIFICATION NO.

DRAWN BY: J.C. BUNCH
DESIGN DIV.: COMMERCIAL SHIP
DEPT.: COMMERCIAL SHIP ENG.
CHECKED BY: J G Boyce
SUPERVISOR: L.W. Creswell
APPROVED: A. Conley 9/22/77
R.L. Harrington
TITLE: WELD INDEX TABULATION FOR CONT. STEAM-UP DK FR 73-89
N.N. DWG. NO. 6450-836
REV. B
CASE | DRAWER | VAULT | SHEET 1 OF 3

WELD JOINT INDEX
NN 198-2 (REV. 1)

JOINT MAP DWG. NO.
ARR. DWG. NO. 6450-775
DETAIL DWG. NO. 6450-675
INDEX DWG. NO. 6450-836
REV. B

LINE	WELD IDENTIFICATION (1)	MATL (2)	JOINT NOM SIZE (3)	JOINT WALL THK (4)	JOINT TYPE (5)	WELD PROCEDURE (6)	ROOT PASS PT/SX (7)	ROOT PASS MT/SX (8)	FINAL WELD VT (9)	FINAL WELD PT (10)	FINAL WELD MT (11)	FINAL WELD RT (12)	POST WELD HEAT TREATMENT (13)	NN 45-5 SERIAL NUMBERS 1ST (14)	2ND (15)	3RD (16)	4TH (17)	REMARKS (18)	REV. (19)
1	CSI-P2K-C	C.STL	8"	.500	P3	W301	NA/NA	NA/NA	NA	NA	NA		NA					H-613C ONLY *	B
2	CSI-P2L-D	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					↓ *	B
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM: CONT. STM-UP DK ~ FR 73-89
COMPARTMENT
HULL H-613
NAVSHIPS DRAWING NO.
REV. B
SHEET 4

6450-836

MICRO-MASTER® 105 mm
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SEPT. '80
FRAME
8X

6450-837 CSD VAULT

WELD INDEX TABULATION
FORM 585

REPRODUCTION SECTION

YARD PRINTS: YES	GROUPING: NO
PRINTS: 1-LWC, 1-CSD,V, 1-KSO Ro/SEPIA	REMARKS: REV "C" PARTIAL ISSUE
	DATE: 4-10-79 SIGNED: Lee Creswell

9-27-77
LWC
CSD-V
KSO
8 PF
3 PF
3 X+3
Ro/SEPIA
7-31-78
LWC
CSD-V
KSO
3 PF
12 PF
3X+3
Ro/SEPIA

4-6-79
LWC
CSD-V
KSO
12 PF
3X+3
461A
Ro/sepia

GENERAL NOTES
1. PIPING WELDED JOINTS ARE TO BE FABRICATED IN ACCORDANCE WITH NN DWG 257035.
2. ASTERISK (*) IN REMARKS COLUMN DENOTES WELD JOINTS MADE ON THE SHIP AND ARE INDICATED ON THE BODY OF THE PIPING ARRANGEMENT.

REF. DWGS.
6450-777 PIPING ARR - CONT. STM & EXH. - UP DK - FR 89-105
6450-676 - PIPE DETS. - CONT. STM - UP DK FOR ARR 6450-777

VESSEL IDENTIFICATION NO.	HULL
	614C
	613C

DRAWN BY: J. C. BUNCH	DESIGN DIV.: COMMERCIAL SHIP	DEPT.: COMMERCIAL SHIP ENG.
CHECKED BY: JGBOYCE	TITLE: WELD INDEX TABULATION FOR CONT. STEAM-UP DK FR 89-105	
SUPERVISOR: Lee Creswell		
APPROVED: H. Cooley 9/22/77	N.N. DWG. NO.: 6450-837	REV. C
R.L. Harrington	CASE / DRAWER / VAULT / SHEET 1 OF 4	

1013,

PIPING WELD INDEX TABULATION
FORM 586

REV.	IDENTIFICATION SHT. NO.	IDENTIFICATION LINE NO.	DESCRIPTION	DATE	APP'D.
A	-	-	INITIAL ISSUE JCB	—	—
B	4	7	ADDED WELD INDEX NO. PIV	4/25/78	LWC
C	4 4	7 8	ADDED "APPLICABLE TO H614C ONLY." JMN ADDED	4/10/79	JRC LWC

HULL NO. 613C, 614C DWG. NO. 6450-837 SHEET NO. 2 REV. C

WELD JOINT INDEX
NN 198-2 (REV. 1)

JOINT MAP DWG. NO.
ARR. DWG. NO. 6450-777
DETAIL DWG. NO. 6450-676
INDEX DWG. NO. 6450-837 REV. A

LINE	WELD IDENTIFICATION (1)	MATL (2)	JOINT NOM SIZE (3)	JOINT WALL THK (4)	JOINT TYPE (5)	WELD PROCEDURE (6)	ROOT PASS PT/SX (7)	ROOT PASS MT/SX (8)	FINAL WELD VT (9)	FINAL WELD PT (10)	FINAL WELD MT (11)	FINAL WELD RT (12)	POST WELD HEAT TREATMENT (13)	NN 45-5 SERIAL NUMBERS 1ST (14)	2ND (15)	3RD (16)	4TH (17)	REMARKS (18)	REV. (19)
1	CS2-P5N-A	C-STL	8"	.500	P3	W301	NA/NA	NA/NA	NA	NA	NA		NA					*	
2	CS2-P5N-B																		
3	CS2-P5P-A																	*	
4	CS2-P5Q-A																	*	
5	CS2-P5Q-B																		
6	CS2-P5R-A																	*	
7	CS2-P5R-B																		
8	CS2-P5S-A																	*	
9	CS2-P5S-B																		
10	CS2-P5T-A																	*	
11	CS2-P5T-B																		
12	CS2-P5U-A																	*	
13	CS2-P5U-B																		
14	CS2-P5V-A																	*	
15	CS2-P5V-B																		
16	CS2-P5W-A																	*	
17	CS2-P5W-B																		
18	CS2-P5X-A																	*	
19	CS2-P5X-B	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM: CONT. STM.-UP DK-FR 89-105
COMPARTMENT:
HULL 613C 614C
NAVSHIPS DRAWING NO.
REV. A SHEET 3

WELD JOINT INDEX
NN 198-2 (REV. 1)

JOINT MAP DWG. NO.
ARR. DWG. NO. 6450-777
DETAIL DWG. NO. 6450-676
INDEX DWG. NO. 6450-837 REV. A

LINE	WELD IDENTIFICATION (1)	MATL (2)	JOINT NOM SIZE (3)	JOINT WALL THK (4)	JOINT TYPE (5)	WELD PROCEDURE (6)	ROOT PASS PT/SX (7)	ROOT PASS MT/SX (8)	FINAL WELD VT (9)	FINAL WELD PT (10)	FINAL WELD MT (11)	FINAL WELD RT (12)	POST WELD HEAT TREATMENT (13)	NN 45-5 SERIAL NUMBERS 1ST (14)	2ND (15)	3RD (16)	4TH (17)	REMARKS (18)	REV. (19)
1	CS2-P5X-C	C-STL	8"	.500	P3	W301	NA/NA	NA/NA	NA	NA	NA		NA						
2	CS2-P5AM-A																	*	
3	CS2-P5AM-B																		
4	CS2-P5AM-C																		
5	CS2-P5AM-D																		
6	CS2-P5AM-E																		
7	CS2-P5X-D																	APPLICABLE TO HULL 614C ONLY	
8	CS2-P5P-B	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓					↓	
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN
SYSTEM: CONT. STM-UP DK FR 89-105
COMPARTMENT:
HULL 613C 614C
NAVSHIPS DRAWING NO.
REV. C SHEET 4

6450-837

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
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SEPT. '80

FRAME

8X

6450-838

MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME

8X

6450-838 CSD VAULT

WELD INDEX TABULATION
FORM 595

REPRODUCTION SECTION

YARD PRINTS: YES	GROUPING: No
PRINTS: LWC, K-50, CSD-V, RO/SEPIA	REMARKS:
	DATE: 10-25-77 / SIGNED: L.W. Croswell

10-1-77
LWC
K-50
CSD-V
8 PS
3 PF
3x3
RO/SEPIA

GENERAL NOTES

1. PIPING WELDED JOINTS ARE TO BE FABRICATED IN ACCORDANCE WITH NN DWG 257035.
2. ASTERISK (*) IN REMARKS COLUMN DENOTES WELD JOINTS MADE ON THE SHIP AND ARE INDICATED ON THE BODY OF THE PIPING ARRANGEMENT.

REF. DWGS.

6450-779 PIPING ARR - CONTAMINATED STEAM - UPPER DK - FWD FR 105
6450-677 PIPE DETS. - CONT. STEAM - UPPER DK - FOR ARR DWG 6450-779

		613 C & 614 C
DRAWN BY: K. S. NEUMANN	VESSEL IDENTIFICATION NO. — DESIGN DIV.: COMMERCIAL SHIP	HULL — DEPT.: COMMERCIAL SHIP ENGR.
CHECKED BY: J.W. BORDEAUX	TITLE: WELD INDEX TABULATION FOR CONTAMINATED STEAM UP DK - FWD FR 105	
SUPERVISOR: L.W. Croswell 10-25-77		
APPROVED: A. Conley 10-26-77		
R. L. Harrington 10-26-77	N.N. DWG. NO.: 6450-838	REV.: A
	CASE / DRAWER / VAULT	SHEET 1 OF 3

PIPING WELD INDEX TABULATION
FORM 596

REV.	IDENTIFICATION SHT. NO.	IDENTIFICATION LINE NO.	DESCRIPTION	DATE	APP'D.
A	–	–	INITIAL ISSUE	—	—

HULL NO.: 613C & 614 C DWG. NO.: 6450-838 SHEET NO. 2 REV.: A

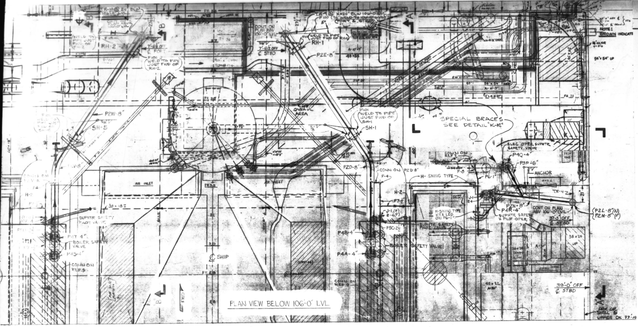
WELD JOINT INDEX
NN 198-2 (REV. 1)

JOINT MAP DWG. NO.: ARR. DWG. NO.: 6450-779 DETAIL DWG. NO.: 6450-677 INDEX DWG. NO.: 6450-838 REV.: A

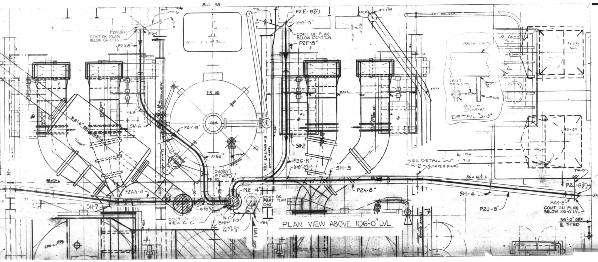
LINE	WELD IDENTIFICATION 1	MATL 2	JOINT NOM SIZE 3	JOINT WALL THK 4	JOINT TYPE 5	WELD PROCEDURE 6	ROOT PASS PT/SX 7	ROOT PASS MT/SX 8	FINAL WELD VT 9	FINAL WELD PT 10	FINAL WELD MT 11	FINAL WELD RT 12	POST WELD HEAT TREATMENT 13	NN 45-5 SERIAL NUMBERS 1ST 14	2ND 15	3RD 16	4TH 17	REMARKS 18	REV. 19
1	CS 3-P2H-A	C-STL	6"	.432	P3	W301	NA NA	NA NA	NA	NA	NA		NA					SEE NOTE 2 *	
2	CS 3-P2H-B																		
3	CS 3-P2J-A																	*	
4	CS 3-P2J-B																		
5	CS 3-P2K-A																	*	
6	CS 3-P2K-B																		
7	CS 3-P2L-A																	*	
8	CS 3-P2L-B																		
9	CS 3-P2M-A																	*	
10	CS 3-P2M-B																		
11	CS 3-P2N-A																	*	
12	CS 3-P2N-B																		
13	CS 3-P2P-A																	*	
14	CS 3-P2P-B																		
15	CS 3-P2L-C																		
16	CS 3-P2M-C	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓						
17																			
18																			
19																			

NOTE: COLUMNS 1-13 AND 19 TO BE FILLED IN BY DESIGN

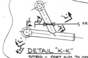
SYSTEM: CONTAMINATED STM - UP DK - FWD FR 105 COMPARTMENT: HULL: 613C & 614C NAVSHIPS DRAWING NO.: REV.: A SHEET: 3


SPECIAL BRACES SEE DETAIL "K-K"
F101 WELD TO PIPE JUST FWD OF SH-1
SH-1
SH-5
P2W-8"
RH-1
RH-2
P2E-8"
P2D-8"
CONN ON P2D-8"
H-SWING TYPE
H-2
P4Q-4"
P3P-6"
ANCHOR
P2N-8"
P4R-4"
SUPHTR SAFETY V. PILOT OPER
CONT ON PLAN ABV 106'-0" LVL
37'-5" OFF ℄ STBD
{P2L-8"(N) {P2M-8"(F)
TR-4
ELEC OPER SUPHTR SAFETY VALVE
AIR INLET
SUPHTR SAFETY PILOT VALVE
P3T 4" BOILER SAFETY VALVE
P4S-4"
CONN ON REF 5
P4B-4"
P4A-4"
P5C-2½"
BOILER SAFETY VALVE
℄ SHIP
39'-0" OFF ℄ STBD
NOTE: BROWN INDICATE
54"×54" UP

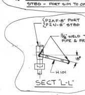
PLAN VIEW BELOW 106'-0" LVL


"C"
P2E-8(F)
X-9'-0"
CONT ON PLAN BELOW 106'-0" LVL
P2F-8"
P2W-8(F)
P2X-8"
CONT ON PLAN BELOW 106'-0" LVL
TR-1
FR 35
SH-6
P2Y-8"
X-6'-2"
SH-2
P2G-8"
X-8'-2"(F)
SH-3
SEE DETAIL "J-J"
TR-2 (HORIZ & FWD)
P2H-8"
SH-4
P2J-8"
P2K-8"
CONT ON PLAN BELOW 106'-0" LVL
P2L-8(F)
X-6'-5"
TR-3
P2AA-8"
SH-7
P1Z-14"
CONT ON PART PLAN "G-G"
CONT ON SECT VIEW C-C
℄ SHIP
FWD
39'-0" OFF ℄ STBD
DETAIL "J-J"
F-100
{P2J-8" {P2AB-8"

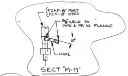
PLAN VIEW ABOVE 106'-0" LVL



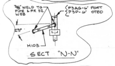
DETAIL "K-K"
STBD - PORT SIM TO OPP HAND


{P2AF-8" PORT {P2N-8" STBD
3/8" WELD TO PIPE & FR 32 WEB
18°
H101

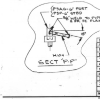
SECT "L-L"


{P2AF-8" PORT {P2N-8" STBD
3/8" WELD TO PIPE & FR 32 FLANGE
10°
H102

SECT "M-M"


3/8" WELD TO PIPE & FR 32 WEB
{P3AG-6" PORT {P3P-6" STBD
23°
H103

SECT "N-N"


{P3AG-6" PORT {P3P-6" STBD
3/8" WELD TO PIPE & FR 32 FLANGE
18°
H104

SECT "P-P"

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH	OWNER DATE	OWNER APPD
A	—	INITIAL ISSUE	11/19/76		—	—
B	—	DRAWING COMPLETELY REVISED TO SUIT ENG TECH COMMENT PRINT	4/10/7		—	—
C	-	ADDED SPECIAL HANGERS THROUGH OUT PLAN GER	9/27/8			

~~AUTHORITY:~~

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCES 1 AND 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REFERENCE 1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. AND REFERENCE 3.
4. BACKING RINGS AND COUPLINGS SHOWN IN LIST OF MAT'L ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMP AND ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REFERENCE 6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REFERENCE 1.
9. HANGERS SHOWN IN MAT'L LIST ARE TO BE INSTALLED IN ACCORDANCE WITH REF 4 & NOTE 16.
10. INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REFERENCE 5.
11. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
12. ALL PIPING ON THIS DRAWING IS CLASS II.
13. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOW: BUTT WELDS TYPE P-3, SOCKET WELDS TYPE P-14, AND FLANGE WELDS TYPE P-16A ON REFERENCE 3 EXCEPT AS OTHRWISE INDICATED.
14. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
15. ALL HOLECUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.
16. HANGERS (SH-1) AND TIE RODS (TR-1) SHOWN ON PLAN ARE TO BE INSTALLED WITHIN 6" OF POSITION SHOWN. ADDITIONAL HANGERS TO BE ADDED ONLY WHERE INDICATED ON THE PLAN & SHALL BE INSTALLED IN ACCORDANCE WITH REF 4.

FOR LIST OF MATERIAL SEE DWG Nº 6451-469

REVISION APPLICABILITY			
REV	N.N. HULL NO. 613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	NO

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS
ABS NOT REQ'D
USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

SCALE 1/2" = 1 FT
DRAWN E.R. SMOOT
CHECKED H.M. EDGE
SECT MGR
DATE COMPL 11-19-76
EXAMINED
AUTHORIZED
DATE 11-19-76
TECH APPROVAL
C S D APPROVAL R.L. Harrington

NO.	REFERENCES	DWG NO.
11	PP ARR RELIEF V. ESCAPE SYS E.R. - PLAN, SECT, ELEV	6451-494
10	ARR PP IN OUTER SMOKESTACK - PLAN, SECT, ELEV	6451-499
9	PP ARR BOILER SATURATED ST & SUPERHTR CONTROL	6440-517
8	PIPE DET STL BLR SAF VLV ESC SYS E.R.	6451-470
7	PP ARR MN STEAM SYS - PLAN	6440-507
6	PAINTING SCHEDULE	8300-392
5	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
4	STD PIPE HANGERS & INSTALLATION INSTR	257056
3	FABRICATION & WELDING INSTRUCTIONS-CL I & II PIPING	257035
2	↑ ↑ ↑ ↑ ↑ ↑ ARR	6451-471
1	DIAGRAM - AUX EXHAUST, L.P. BLD ST & RELIEF V. ESC - LIST	6451-472

PIPING ARR BOILER SAFETY V. ESCAPE
SYS E.R. - PLAN, SECT, ELEV

USMA DESIGN TII-S-116a
USMA DWG NO.
HULL NO.
DWG NO. 6451-468
REV C
SHEET NO. 1 OF 1

●HULLS 613C & 614C
△HULL 615 ONLY

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
GROUP: MC NO.

6451-468

MICRO-MASTER 105 mm
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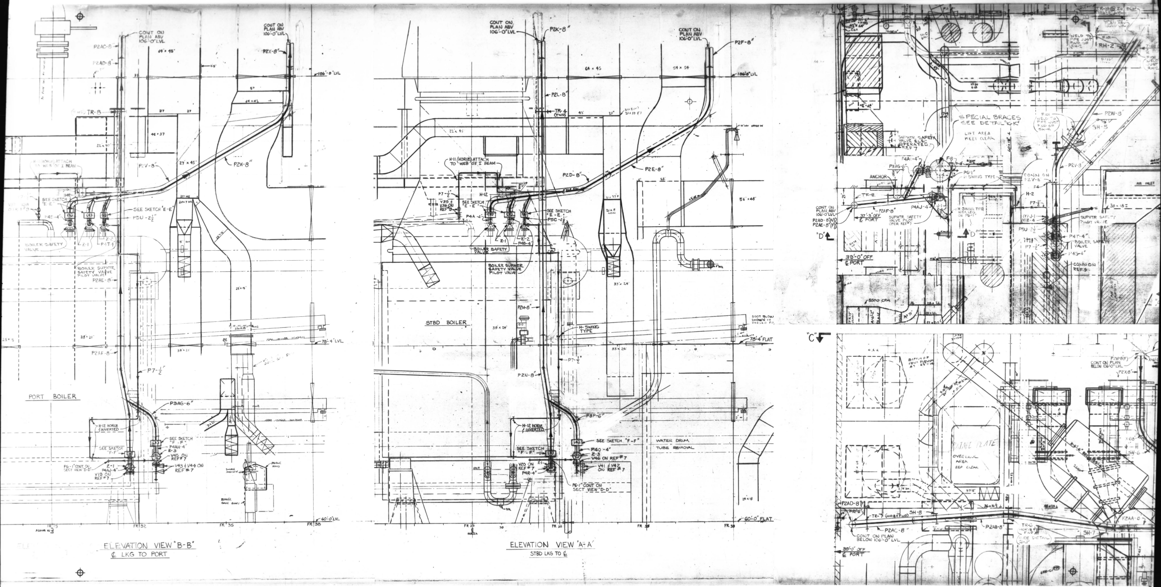
SEPT. '80
FRAME 1
10X


CONT ON PLAN ABV 106'-0" LVL
P2AC-8"
P2AD-8"
TR-8
P2V-8"
P2W-8"
P2X-8"
106'-0" LVL
64 x 45
64 x 42
46 x 37
27" x 45"
SEE SKETCH "E-E"
P5U-2½"
P4S-4"
Z-1
P7-1
BOILER SAFETY VALVE
BOILER SUPHTR SAFETY VALVE PILOT VALVE
P2AE-8"
P2AF-8"
38 x 21
78'-4" LVL
P7-½"
PORT BOILER
P3AG-6"
H-12 HORIZ INVERTED
SEE SKETCH "F-F"
P6-1" CONT ON SECT VIEW "D-D"
P4AH-4"
Z-3
V45 ON REF #7
V43 & V44 ON REF #7
V19 ON REF #7
FR 32
FR 35
FR 38
60'-0" LVL
ELEVATION VIEW "B-B"
℄ LKG TO PORT
P2K-8"
P2L-8"
TR-4
P2D-8"
P2E-8"
P2F-8"
54 x 54
H-11 (HORIZ) ATTACH TO WEB OF I BEAM
H-12
P7-½"
V35 & V36 ON REF #7
P4A-4"
SEE SKETCH "E-E"
P5C-2½"
Z-2
P4B-4"
BOILER SAFETY VALVE
BOILER SUPHTR SAFETY VALVE PILOT VALVE
STBD BOILER
P2M-8"
H-SWING TYPE
SOOT BLOW SHOWN IN RECUED PO
78'-4" FLAT
P2N-8"
P3P-6"
H-12 HORIZ INVERTED
SEE SKETCH "F-F"
P4Q-4"
Z-3
V46 ON REF #7
V41 & V42 ON REF #7
V20 ON REF #7
P4R-4"
P6-1" CONT ON SECT VIEW "D-D"
WATER DRUM TUBE REMOVAL
56 x 48
33 x 24
FR 29
FR 32
FR 35
FR 38
60'-0" FLAT
ELEVATION VIEW "A-A"
STBD LKG TO ℄
SPECIAL BRACES SEE DETAIL "K-K"
LIFT AREA KEEP CLEAR
SUPHTR SAFETY VALVE ELEC OPERATED REF 7
F4A-4"
P3AG-6"
ANCHOR
P6-1"
H-SWING TYPE
CONT ON PLAN ABV 106'-0" LVL
P2AD-8"
P2AE-8"
P2AF-8"
37'-3" OFF ℄ PORT
P4AJ-4
SUPHTR SAFETY VALVE PILOT (PER REF 7)
"D"
39'-0" OFF ℄ PORT
5500 CFM
RH-2
SH-5
P2W-8"
P2V-8"
CONN ON P2V-8
H-2
SUPHTR SAFETY PILOT VALVE
P4T-4"
BOILER SAFETY VALVE
P4S-4"
P5U-2½"
P7-½"
CONN ON REF 3
AIR INLET
"C"
BOTTOM OF VENT PLENUM
OVERHAUL AREA KEEP CLEAR
P2W-8(F) CONT ON PLAN BELOW 106'-0" LVL
P2X-8"
SH-6
P2AD-8"
TR-7
SH-8
P2AB-8"
P2AC-8"
CONT ON PLAN BELOW 106'-0" LVL
TR-6 SEE DETAIL
P2AA-8"
SH-7
38'-0" OFF ℄ PORT

6451-468

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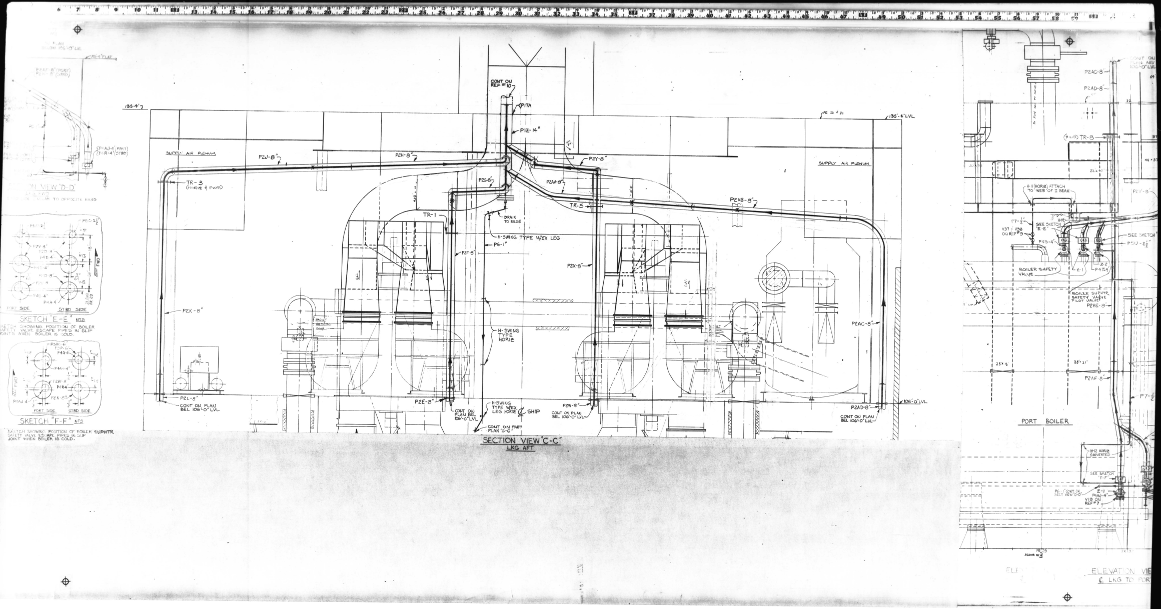
FRAME 2

10X


SUPPLY AIR PLENUM
CONT ON REF # 10
P17A
P1Z-14"
P2J-8"
P2H-8"
P2Y-8"
P2AA-8"
P2AB-8"
P2G-8"
TR-3 (HORIZ & FWD)
TR-1
TR-5
DRAIN TO BILGE
H-SWING TYPE W/EX. LEG
P6-1"
P2F-8"
P2X-8"
P2K-8"
H-SWING TYPE HORIZ
P2AC-8"
P2L-8"
CONT ON PLAN BEL 106'-0" LVL
P2E-8"
CONT ON PLAN BEL 106'-0" LVL
H-SWING TYPE W/EX LEG HORIZ
℄ SHIP
CONT ON PART PLAN "G-G"
P2W-8"
P2AD-8"
106'-0" LVL
135'-4" LVL
SECTION VIEW "C-C"
LKG AFT
SECTION VIEW "D-D"
SKETCH "E-E" NTS
SKETCH SHOWING POSITION OF BOILER SAFETY VALVE ESCAPE PIPES IN SLIP JOINTS WHEN BOILER IS COLD.
PORT SIDE
STBD SIDE
FWD
SKETCH "F-F" NTS
SKETCH SHOWING POSITION OF BOILER SUPHTR SAFETY VALVE ESCAPE PIPES IN SLIP JOINT WHEN BOILER IS COLD.
P2AC-8"
P2AD-8"
TR-8
H-11 (HORIZ) ATTACH TO WEB OF I BEAM
P7-1"
V37 / V38 ON REF #9
SEE SKETCH "E-E"
P45-4"
SEE SKETCH
P5U-2½"
BOILER SAFETY VALVE
Z-1
Z-2
P4T-4"
BOILER SUPHTR SAFETY VALVE PILOT VALVE
P2AE-8"
P2V-8"
P2AF-8"
PORT BOILER
H-12 HORIZ INVERTED
SEE SKETCH "F-F"
P6-1" CONT ON SECT VIEW "D-D"
P4AJ-4"
V18 ON REF #7
ELEVATION VIEW
℄ LKG TO PORT

6451-468

MICRO-MASTER 105 mm

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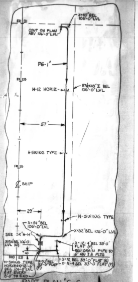
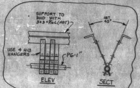
SEPT. '80

FRAME 3

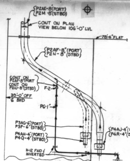
10X


FR 31
X=40" BEL 106'-0" LVL
CONT ON PLAN ABV 106'-0" LVL
P6-1"
FR 29
H-12 HORIZ
5⅞"X18" I BEL 106'-0" LVL
57'
H-SWING TYPE
FR 26
℄ SHIP
29'
H-SWING TYPE
X=54" BEL 106'-0" LVL
SEE SK "H-H"
X=52" BEL 106'-0" LVL
X=54 BEL 106'-0 LVL (N)
X=12-4" BEL 33'-0" FLAT (N)
RUN DRAIN PIPE TO 6" ABV I.B. PLTG
BHD 23
H-SWING TYPE HORIZ @ X=12'-6" BEL 106'-0" LVL & AT EVERY 8'-0" TO END
X=52" BEL 33'-0" FLAT
X=72 BEL 33'-0" FLAT (N)
X=11-4 BEL 33'-0 FLAT (F)
FWD

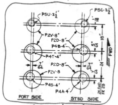
PART PLAN "G-G"


SUPPORT TO BHD WITH 3×3×5/16 L (ABT)
ABT 45°
USE 4 H-13 HANGERS
P6-1"
ELEV
SECT

DETAIL SKETCH "H-H"

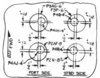

P2AE-8 (PORT)
P2M-8 (STBD)
CONT ON PLAN VIEW BELOW 106'-0" LVL
78'-4" FLAT
P2AF-8" (PORT)
P2N-8" (STBD)
CONT ON P2AF-8 (PORT)
CONT ON P2N-8 (STBD)
F-2
30'-0" OFF ℄ BHD
P6-1"
P3AG-6" (PORT)
P3P-6" (STBD)
P4AH-4" (PORT)
P4Q-4" (STBD)
P4AJ-4" (PORT)
P4R-4" (STBD)
H-12 FWD INVERTED

SECTION VIEW "D-D"
LKG FWD
STBD SIDE SIMILAR TO OPPOSITE HAND


P5U-2½"
P5C-2½"
P2V-8"
P2D-8"
P4B-4"
P4T-4"
P2D-8"
7/64
P2V-8
P4S-4"
P4A-4"
18
24
FWD
FR 29
PORT SIDE
STBD SIDE

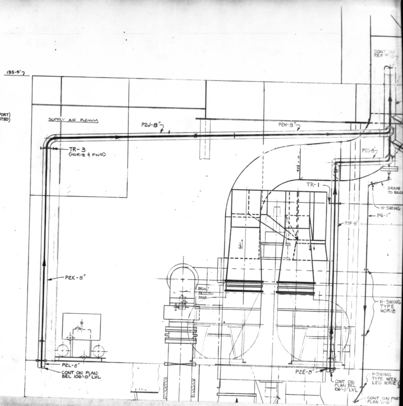
SKETCH "E-E" NTS

SKETCH SHOWING POSITION OF BOILER SAFETY VALVE ESCAPE PIPES IN SLIP JOINTS WHEN BOILER IS COLD.


P3AG-6"
P3P-6"
P4Q-4"
P4AH-4"
P2AF-8
P4R-4"
P2N-8"
P4AJ-4"
FWD
PORT SIDE
STBD SIDE

SKETCH "F-F" NTS

SKETCH SHOWING POSITION OF BOILER SUPHTR SAFETY VALVE ESCAPE PIPES IN SLIP JOINT WHEN BOILER IS COLD.


135'-4"
SUPPLY AIR PLENUM
P2J-8"
P2H-8"
TR-3 (HORIZ & FWD)
P2G-8"
CONT ON REF
TR-1
DRAIN TO BILGE
H-SWING
P6-1"
P2F-8"
P2K-8"
H-SWING TYPE HORIZ
P2L-8"
CONT ON PLAN BEL 106'-0" LVL
P2E-8"
CONT ON PLAN BEL 106'-0" LVL
H-SWING TYPE W/EX LEG HORIZ
CONT ON PART PLAN "G-G"

SECTION
LKG

6451-468

SEPT. '80
FRAME 4
10X

6451-469

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

6451-469 CSD VAULT

E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 6-5-79
SIGNED J. H. Johnson

YARD PRINTS — ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS										
REV.	C	C	B	C	C	C	B	C	C	B
SHEET	1	2	3	4	5	6	7	8	9	10

GROUP
MC NO.

NNS&DDCO HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C	311	T11-S-116a	
614C	310		
613C	309		

DWG. REV. — HULL APPLIC. NN HULLS ONLY

REV.	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	NO

APPROVALS
OWNERS
ABS NOT REQ'D
USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689

INSTALLATION GROUPS 6451-1601-1002 PI
6451-0114-1202 SI
6451-0114-1103 SI

ARR DWG 6451-468
PIPE DETAIL 6451-470

SCALE NONE =1 Ft.
DRAWN E.R. SMOOT
CHECKED H.M. EDGE
SECT. MGR. J H Johnson
DATE COMPL. 11-19-76
EXAMINED
AUTHORIZED E E Stephenson
DATE 11-19-76
TECH. APPROVAL NOT REQ'D
CSD APPROVAL R. L. Harrington

GROUPED BY CHK. — DATES PART COMP. — HULL 613C GROUP NO. KEY
TYPE OF DWG.

TITLE
PIPING ARR BOILER SAFETY VALVE
ESCAPE SYS E.R.-LIST OF MATERIAL

DWG. NO. 6451-469 REV C SHEET NO. 1 OF 10

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE	11/19/76	JHJ	—	—
B	ALL	LIST OF MATERIAL COMPLETELY REVISED TO AGREE WITH REWORKED ARR DWG.				
	3 6 8 3	ALT'D LN 11 TO "X" HVY PIPE ADDED LN 7. ADDED LN 7. ADDED LN 15.	4/16/7	AC JHJ		
C	4 5 6 8 9	ADDED LINES 4 THRU 9, & 11 THRU 17 ADDED LINE 13, & LINES 16 THRU 18 ADDED LINES 11 & 12, 17 & 18, 8 & 9 ADDED LINES 12, 16, 17, & 18, 8 & 9 ADDED LINES 11 & 12, 17 & 18	10/3/78 GER	JHJ		

NOTES

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF #1.

NO.	REFERENCES	DWG. NO.
1	DIAG AUX EXH, BLEED ST, & RELIEF V. ESCAPE - LIST	6451-472

HULL NO. 613C, 614C, 615C DWG. NO. 6451-469 REV. C SHEET 2 OF —

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2F	8" IPS x STD THK STL PIPE	PMD 6451-470	PS	
		2	1	P2G	8"			
		3	1	P2H	8"			
		4	1	P2J	8"			
		5	1	P2K	8"			
		6	1	P2X	8"			
		7	1	P2Y	8"			
		8	1	P2AA	8"			
		9	1	P2AB	8"			
		10	1	P2AC	8"			
		11	1	P1Z	14" IPS x "X" HVY THK STL PIPE			
		12	23'-0"	P6	1" IPS x "X" HVY THK STL PIPE	K57-06-104		
		13						
		14	1	F7	1" UNION MI THR'D 300#	PO ③ 2400-C27	MD-PS	
		15	1	F9	1" TEE S.W. STL 3000#	S 25-60-079	ST-PS	
		16	10	H13	8" HANGER SINGLE LEG SWING TYPE WITH LINER	S/ 25-48-446	ST-PS	
		17	3	H13	1"	S/ 25-48-346		
		18						

REMARKS -

PS 178

SERVICE - BOILER SAFETY V. ESC SYS (ABV 106'-0" LVL)
GROUP NO. 6451-1601-1002 PI SHT 1 OF 2
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-469 SHEET 3 REV. B

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No.	DESCRIPTION			MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	14	F3	8" BACKING RING STD THK			608C ⑭ 2280-C70	MD-PS	
		2								
		3		HGR NO						
C		4	1	TR-1	8" TIE ROD HGR			MO 283285 SH4 L1		
C		5	1	TR-2	8"			MO 283285 SH4 L4		
C		6	1	TR-3	8"			MO 283285 SH4 L10		
C		7	1	TR-5	8"			MO 283285 SH4 L16		
C		8	1	TR-6	8"			MO 283285 SH5 L1		
C		9	1	TR-7	8"			MO 283285 SH5 L7		
		10				HOT LOAD #	VERT MOVE- "IN"			
C		11	1	SH-2	8" SPRING HGR	366#	.35" DOWN	PO 6552-C16 ㉖ * PO 6552-C16 ㊶ Δ		
C		12	1	SH-3	8"	423#	.33" UP	PO 6552-C16 ㉝ * PO 6552-C16 ㊷ Δ		
C		13	1	SH-4	8"	1006#	2.72" UP	H-1279-00-030 * PO 6451-C16 ① Δ		1006
C		14	1	SH-6	8"	379#	.15" UP	PO 6552-C16 ㊺ * PO 6552-C16 ⑧ Δ		
C		15	1	SH-7	8"	518#	.03" UP	PO 6552-C16 ⑥ * PO 6552-C16 (111) Δ		
C		16	1	SH-8	8"	1045#	2.62" UP	H-1279-00-030 * PO 6451-C16 ② Δ		1045
C		17	2	F100	4" x 2.66" x 7.7 lb/ft STEEL I-BEAM L= 36"			S/ 73-08-204		
		18								

REMARKS - * H613C ONLY } X-42 TO REPLACE CLAMP &
Δ H614C ONLY } OTHER MAT'L

PS 178

SERVICE - BOILER SAFETY V. ESCAPE SYS. (ABV 106'-0" LVL)
GROUP NO. 6451-1601-1002 PI SHT 2 OF 2
APPLICABLE HULLS
DWG NO. 6451-469 SHEET 4 REV. C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION			MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P4S	4" IPS x STD THK STL PIPE			PMD 6451-470	PS	
		2	1	P4T	4"					
		3	1	P5U	2½"					
		4	1	P2V	8"					
		5	1	P2W	8"					
		6	1	P2AD	8"					
		7	1	P2AE	8"					
		8	1	P2AF	8"					
		9	1	P3AG	6"					
		10	1	P4AH	4"					
		11	1	P4AJ	4"					
		12								
C		13	4	F101	1½" x ½" FB ABS STEEL L=3"			S/ 71-30-260		
		14	23'-0"	P6	1" IPS x STD THK STL PIPE			K57-06-104	PS	
		15	55'-0"	P7	½" IPS x "X" HVY THK STL PIPE			K57-07-102		
C		16	1	TR-8	8" TIE ROD HGR			MO 283285 SH5 L10		
C		17	1	RH-2	8" ROD HGR			MO 283285 SH6 L1		
C		18	1	SH-5	8" SPRING HGR	HOT LOAD 257#	VERT MOVE .03" UP	PO 6552-C16 ㉞ * PO 6552-C16 ㉔ Δ		

REMARKS - * H613C ONLY } X-42 TO REPLACE CLAMP &
Δ H614C ONLY } OTHER MAT'L

PS 173

SERVICE - BOILER SAFETY V. ESCAPE SYS (PORT BOILER)
GROUP NO. 6451-0114-1202 SI SHT 1 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-469 SHEET 5 REV. C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1						
		2	1	F2	1" COUPLING STL SW 3000#	PO ③ 6951-C3	MD-PS	
		3	3	F3	8" BACKING RING STL STD THK	PO 608C- ⑭ 2280-C70		
		4	2	F4	½" 90° ELBOW STL S.W. 3000#	25-60-006		
		5	1	F5	6" BACKING RING STL STD THK	PO 608C- ⑯ 2280-C70	MD-PS	
		6	4	F6	½" COUPLING STL SW. 3000#	PO 608C 2300-C3 ⑧		
		7	1	F8	1" 90° ELBOW STL S.W. 3000#	S 25-60-029	ST-PS	
C		8	1	F100	4" x 2.66" x 7.7 lb/ft STL I-BEAM L=36"	S/ 73-08-204		
C		9	1	TR-10	8" TIEROD HGR	MO 283285 SH5 L1		
		10	2	J1	½" FLANGE 300# STL SW	PO ㉑ 6450-C2	MD-PS	
C		11	1	H-101	FLAT BAR BRACE	MO 283285 SH6 L7		
C		12	1	H-102		MO 283285 SH6 L12		
		13	5	H13	8" HANGER SINGLE LEG SWING TYPE WITH LINER	S/ 25-48-446	ST-PS	
		14	2	H13	6"	S/ 25-48-436		
		15	2	H13	1"	S/ 25-48-346		
		16	8	H13	½"	S/ 25-48-326		
C		17	1	H-103	FLAT BAR BRACE	MO 283285 SH7 L1		
C		18	1	H-104		MO 283285 SH7 L6		

REMARKS -

PS 173

SERVICE - BOILER SAFETY V. ESCAPE SYS (PORT BOILER)
GROUP NO. 6451-0114-1202 SI SHT 2 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-469 SHEET 6 REV. C

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	32	Z1	4" 150#	BOLTS	⅝" HVY HEX HD STL L=3"	PO 6000-C7 ㉕	MD-PS	
	2	32			NUTS	⅝" HVY HEX STL	PO 6000-C12 ⑱		
	3	4			GSKT	1/16" THK COMP ASBESTOS	S/ 15-01-278E	ST-PS	
	4	4	Z2	2½" 150#	BOLTS	⅝" HVY HEX HD STL L=2¾"	PO 6000-C7 ㉖	MD-PS	
	5	4			NUTS	⅝" HVY HEX STL	PO 6000-C12 ⑱		
	6	1			GSKT	1/16" THK COMP ASBESTOS	S/ 15-01-272E	ST-PS	
	7	8	Z3	4" 300#	BOLTS	¾" HVY HEX HD STL L=4½"	PO 6000-C7 ㊻	MD-PS	
	8	8			NUTS	¾" HVY HEX STL	PO 6000-C12 ⑭		
	9	1			GSKT	1/16" THK COMP ASBESTOS	S/ 15-01-278E	ST-PS	
	10	8	Z4	½" 300#	BOLTS	½" HVY HEX HD STL L=2¾"	PO 6000-C7 ㊹	MD-PS	
	11	8			NUTS	½" HVY HEX STL	PO 6000-C11 ①		
	12	2			GSKT	1/16" THK COMP ASBESTOS	S/ 15-01-260E	ST-PS	
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				

REMARKS -

PS 173

SERVICE - BOILER SAFETY V. ESCAPE SYS (PORT BOILER)
GROUP NO. 6451-0114-1202-SI SHT 3 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-469 SHEET 7 REV. B

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION			MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P4A	4" IPS x STD THK STL PIPE			PMD 6451-470	PS	
		2	1	P4B	4"					
		3	1	P5C	2½"					
		4	1	P2D	8"					
		5	1	P2E	8"					
		6	1	P2L	8"					
		7	1	P2M	8"					
		8	1	P2N	8"					
		9	1	P3P	6"					
		10	1	P4Q	4"					
		11	1	P4R	4					
C		12	4	F101	1½" x ½" FB ABS STEEL L=3"			S/ 71-30-260		
		13								
		14	150'-0"	P6	1" IPS x STD THK STL PIPE			K57-06-104	PS	
		15	55'-0"	P7	½" IPS x "X" HVY THK STL PIPE			K57-07-102		
C		16	1	TR-4	8" TIE ROD HGR			MO 283285 SH4 L13		
C		17	1	SH-1	8" SPRING HGR	HOT LOAD 266#	VERT MOVE .03" UP	PO 6552-C16 ㉟ * PO 6552-C16 ⑲ Δ		
C		18	1	RH-1	8" ROD HGR			MO 283285 SH5 L13		

REMARKS - * H613C ONLY } X-42 TO REPLACE CLAMP &
Δ H614C ONLY } OTHER MAT'L

PS 173

SERVICE - BOILER SAFETY V. ESCAPE SYS (STBD BOILER)
GROUP NO. 6451-0114-1103 SI SHT 1 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-469 SHEET 8 REV. C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1						
		2	7	F2	1" COUPLING STL SW 3000#	PO ③ 6951-C3	MD-PS	
		3	3	F3	8" BACKING RING STL STD	PO 608C- ⑭ 2280-C70		
		4	1	F4	½" 90° ELBOW STL SW. 3000#	S/ 25-60-006		
		5	2	F5	6" BACKING RING STL STD	PO 608C ⑯ 2280-C70		
		6	4	F6	½" COUPLING STL SW 3000#	PO 608C 2300-C3 ⑧		
		7	1	F8	1" 90° ELBOW STL S.W. 3000#	S 25-60-029	ST-PS	
C		8	1	F100	4" x 2.66" x 7.7 lb/ft STL I-BEAM L=36"	S/ 73-08-204		
C		9	1	TR-9	8" TIE ROD HGR	MO 283285 SH5 L1		
		10	2	J1	½" FLANGE 300# ST SW	PO ㉑ 6450-C2	MD-PS	
C		11	1	H-101	FLAT BAR BRACE	MO 283285 SH6 L7		
C		12	1	H-102		MO 283285 SH6 L12		
		13	5	H13	8" HANGER SINGLE LEG SWING TYPE WITH LINER	S/ 25-48-446	ST-PS	
		14	2	H13	6"	S/ 25-48-436		
		15	20	H13	1"	S/ 25-48-346		
		16	8	H13	½"	S/ 25-48-326		
C		17	1	H-103	FLAT BAR BRACE	MO 283285 SH7 L1		
C		18	1	H-104		MO 283285 SH7 L6		

REMARKS -

PS 173

SERVICE - BOILER SAFETY V. ESCAPE SYS (STBD BOILER)
GROUP NO. 6451-0114-1103 SI SHT 2 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-469 SHEET 9 REV. C

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY ___ SHIP	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	32	Z1	4" 150#	BOLTS	5/8" HVY HEX HD STL L= 3"	PO 6000-C7 ㉕	MD-PS	
	2	32			NUTS	5/8" HVY HEX STL	PO 6000-C12 ⑱		
	3	4			GSKT	1/16" COMP ASBESTOS	S/ 15-01-278E	ST-PS	
	4	4	Z2	2½" 150#	BOLTS	5/8" HVY HEX HD STL L=2¾"	PO 6000-C7 ㉖	MD-PS	
	5	4			NUTS	5/8" HVY HEX STL	PO 6000-C12 ⑱		
	6	1			GSKT	1/16" COMP ASBESTOS	S/15-01-272E	ST-PS	
	7	8	Z3	4" 300#	BOLTS	3/4" HVY HEX HD STL L=4½"	PO 6000-C7 (56)	MD-PS	
	8	8			NUTS	3/4" HVY HEX STL	PO 6000-C12 ⑭		
	9	1			GSKT	1/16" COMP ASBESTOS	S/15-01-279E	ST-PS	
	10	8	Z4	½" 300#	BOLTS	1/2" HVY HEX HD STL L=2¾"	PO 6000-C7 (64)	MD-PS	
	11	8			NUTS	1/2" HVY HEX STL	PO 6000-C11 ①		
	12	2			GSKT	1/16" COMP ASBESTOS	S/ 15-01-260E	ST-PS	
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –

SERVICE – BOILER SAFETY V. ESCAPE SYS
(STBD BOILER)

PS 173

								GROUP NO.	6451-0114-1103 SI SHT 3 OF 3		
APPLICABLE HULLS	613C	614C	615C						DWG NO. 6451-469	SHEET 10	REV. B

6451-469

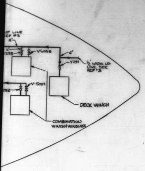
MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME

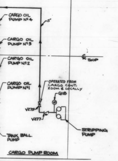
8X



SYMBOL	DESCRIPTION
	PIPE SIZE CHANGE
	WAFER CHECK VALVE
	DESUPHTR
-(T)*	DISTANT READING THERMOMETER
-(P)*	VACUUM-PRESSURE GAGE
-(V)*	VACUUM GAGE ———
-(P)*	PRESSURE GAGE ——— IN EOS
-(P)	VACUUM-PRESSURE GAGE (LOCAL)
-(V)	VACUUM GAGE
-(P)	PRESSURE GAGE
	THERMOMETER
	ORIFICE
	STRAINER
	OIL SEPARATOR
	ANGLE STOP CHK VALVE
	ANGLE VALVE
	RELIEF OR SENTINEL VALVE
	MOTOR OPER BACK PRESS. & RELIEF VALVE
	PRESSURE RED. VALVE
	UNLOADING VALVE
	MOTOR OPER STOP CHK VALVE
	MOTOR OPER STOP VALVE
	MOTOR OPER GATE VALVE
	CHECK VALVE
	GATE VALVE
	GLOBE STOP VALVE

SYMBOL LIST

615C
DIAGRAM
AUX. EXHAUST, L.P. BLEED STEAM
& RELIEF VALVE ESCAPE - ARR.



SYMBOL	DESCRIPTION
	PIPE SIZE CHANGE
	WAFER CHECK VALVE
	DESUPHTR
-(T)*	DISTANT READING THERMOMETER
-(P)*	VACUUM-PRESSURE GAGE
-(V)*	VACUUM GAGE ———
-(P)*	PRESSURE GAGE ——— IN EOS
-(P)	VACUUM - PRESSURE GAGE (LOCAL)
-(V)	VACUUM GAGE
-(P)	PRESSURE GAGE
	THERMOMETER
	ORIFICE
	STRAINER
	OIL SEPARATOR
	ANGLE STOP CHK VALVE
	ANGLE VALVE
	RELIEF OR SENTINEL VALVE
	MOTOR OPER BACK PRESS. & RELIEF VALVE
	PRESSURE RED VALVE
	UNLOADING VALVE
	MOTOR OPER STOP CHK VALVE
	MOTOR OPER STOP VALVE
	MOTOR OPER GATE VALVE
	CHECK VALVE
	GATE VALVE
	GLOBE STOP VALVE

SYMBOL LIST

613C & 614C
DIAGRAM
AUX. EXHAUST, L.P. BLEED STEAM
& RELIEF VALVE ESCAPE - ARR.

1

REVISIONS

N.N. CHANGE ORDER NO.	REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHO	OWNER DATE	OWNER APPD
	A	-	INITIAL ISSUE	11/14/4		—	—
	B	-	ADDED RELIEF VALVE ESCAPE TO TITLE. ALT. PIPE SIZE TO DSTL TO SUIT CHANGE IN DSTL PLANT STEAM REQUIREMENT. DESIGNATED DSTL PLANTS AS SW & CNDS CLD IN LIEU OF Nº 1 & 2 HHE				
		-	APPROVAL LETTERS NOTED				
		-	DELETED, FROM TURBO GEN EXH LINE, VALVE V-212 & ORIFICE AT MN COND CONN. ADDED ORIFICE AT MN COND IN AUX EXH DUMP CONN. ALL TO SUIT DESIGN DEM.				
40		-	DELETED MOTOR OPERATOR FOR HULL-613C & 614C FROM VALVES V213 V255, V256, V265 & V271 THRU V274 THIS TO SUIT NN CO #40 HHE				
11		-	DELETED CARGO OIL STRIPPING PUMP NO.2 & RELATED PIPING FOR HULL 613C & 614C TO SUIT NN CO#11. HHE				
			CARGO & BALLAST PUMP TURBS RELOCATED TO SUIT ACTUAL SHIP ARRANGEMENT.				
40			RING & BLANK FLANGES ADDED IN CARGO & BALLAST P. TURB EXH TO AUX CONDSR FOR H613C & H614C (C.O. #40)	7/30/75		—	—
H613C/H614C 12	C	—	DECK MACHY EXH DELETED FOR H613C & H614C (RELOCATED TO CONTAM. STM SYS)				
—		—	ORIFICES AT CONDENSERS DELETED TO SUIT LATEST CONDENSER DESIGN				
—		—	FOR H615C PIPE SIZES FOR DECK MACHY ALTERED & SENTINEL VLVS AT DECK MACHY DELETED TO SUIT LATEST VENDOR INFO.				
—		—	STRIPPING PUMP EXHAUST SIZE CORRECTED TO SUIT LATEST VENDOR INFO.				
H613C/H614C 12		—	DIAGRAM COMPLETELY REDRAWN FOR H613C & H614C.	8/20/75		—	—
H615C 16	D	-	IN SKETCH "A", WHISTLE STEAM RELIEF VALVE DELETED (H615C)				
20		-	DELETED TURBO GEN EXHAUST TO AUX CONDSR. ALTERED SIZE OF CARGO & BALLAST PUMP EXHAUST TO AUX CONDSR. RBW	10/17/75			
—		—	V264 & V265 REFERED TO NOTE 18 IN LIEU OF NOTE 15.				
H613C/H614C 12	E	—	ADDED V-507 TO SK 'A' FOR H613C/H614C			—	—
—		—	ADDED: OPERATING NOTE FOR V-275 & V276; V279 & V280 SENSING FOR V-246 & V25; SIZES FROM RELIEF VALVES SK 'A'	6/17/7			
	F	—	ADDED V281. SET @ 4" HG WOB				
		—	DELETED G-213 & CHANGED G-212 TO G-112 FOR 613C & 614C. CHANGED G-212 & G-213 TO G-112 & G-113 RESPECTIVELY FOR 615C WOB	9/17/7		—	—
	G	—	ADDED V5058 & V5059. ADDED 1/2" WARM UP LINE. ADDED LOW POINT DR. THE ABOVE CHANGES ARE FOR H615C ONLY			—	—
		—	ADDED 1/2" DRAIN LINES WITH V316 & V317 TO AFT DK WINCH EXH LINES 615C ONLY	11/7/7			
	H	-	ADDED 1/4" PRESSURE SENSING LINE FOR V-260 ADDED V-318				
		-	EXHAUST FROM FIRE PUMP SYS. 'N' ALTERED TO 8".				
		-	DELETED V-315 (H613C & H614C ONLY)				
		-	ADDED RELIEF VALVE SETTINGS FOR V216, V217, V218, V231 & V232	[illegible]			
	J	—	SUPPLY TO DISTILLING PLANTS WAS FROM 1st STG FD HTR LP BLEED LAM	[illegible]			
	K	-	ALT'D-SOURCE OF SENSING LINE FOR V205 & V251 WAS OFT. ADDED V315. LAM	2/6/79			

~~AUTHORITY:~~

~~GENERAL NOTES:~~

FOR LIST OF MAT'L NOTES & REF
SEE NN DWG 6451-472

D

C

B

A

DWG. REV. — HULL APPLIC						
REV	NN HULLS ONLY					
A	YES	YES	YES			
B	YES	YES	YES			
C	YES	YES	YES			
D	YES	YES	YES			
E	YES	YES	YES			
F	YES	YES	YES			
G	—	—	YES			
H	YES	YES	NO			
J	YES	YES	NO			
K	YES	YES	NO			

REPRODUCTION OFFICE
YARD PRINTS NO GROUPING NO
REMARKS
DATE 3/29/79 SIGNED J.N. Johnson

YARD PRINTS

ORDERED BY DESIGN

GROUP: MC NO.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS	ABS
ZAPATA LTR DTD 6 DEC 1975 SHELL LTR DTD 17 DEC 1975	NOT REQ'D
	USCG (MMT) LTR 5940 DTD 26 FEB 1975

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
DESIGN DIV. FSCM NO. 43689
MACHINERY DESIGN DEPT.

SCALE NONE =1 FT
DRAWN D.L. HOFFMAN
CHECKED H.M. EDGE
SECT MGR J.N. Johnson
DATE COMPL. 11-12-74
EXAMINED
AUTHORIZED
DATE 11-19-74
TECH APPROVAL HIS 11/18/74
CSD APPROVAL

DIAGRAM
AUX EXHAUST, LP BLEED STEAM
& RELIEF VALVE ESCAPE - ARR

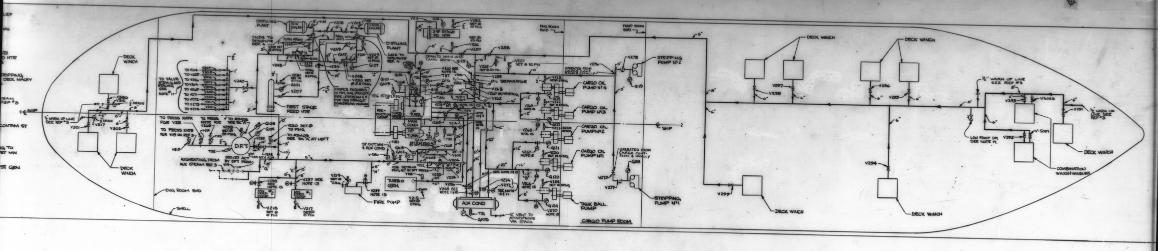
USMA DESIGN T11-S-116a
USMA DWG NO. —
HULL NO. —

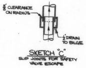
NO.	REFERENCES	DWG NO.

DWG NO. 6451-471
REV K
SHEET NO. 1 OF 1

1

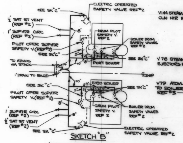
6451-471
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
FRAME 1
10X


DISTILLING PLANT
CNDS TO DESUPHTR REF. 4
DECK WINCH
TO VALVE STEM GLAND SEALING SEE NOTE 11
FIRST STAGE FEED HTR
ORIFICE REQUIRES 10 PIPE DIAS STRAIGHT PIPE UPSTREAM & 5 PIPE DIAS STRAIGHT DOWNSTREAM MINIMUM
2ND STAGE FD HTR
DRAIN TO DRAIN INSP TANK
OIL SEPARATOR
REDUCTION GEAR
LP TURB
HP TURB
MAIN COND
D.F.T.
TO PRESS XMTR FOR V231
TO ATMOS SEE SK "A"
TO ATMOS SEE SK "A" AT LEFT
AUGMENTING FROM AUX STEAM REF 3
850/57 ACT BY DFT PRESS
ST OUT MN 4 AUX COND
MN FEED PUMP #2
MN FEED PUMP #1
FIRE PUMP
TURBO GEN
AUX COND
12" VENT TO ATMOSPHERE VIA STACK
ENG ROOM BHD
SHELL
PUMP ROOM BHD
OPERATED FROM CARGO CONT ROOM & LOCALLY
CARGO OIL PUMP No 4
CARGO OIL PUMP No 3
CARGO OIL PUMP No 2
CARGO OIL PUMP No 1
TANK BALL. PUMP
STRIPPING PUMP No 2
STRIPPING PUMP No 1
CARGO PUMP ROOM
½" WARM UP LINE SEE REF #3
LOW POINT DR SEE NOTE 11
COMBINATION WINCH & WINDLASS
SHIP



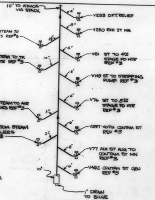
SKETCH "C"
SLIP JOINTS FOR SAFETY VALVE ESCAPE

⅜" CLEARANCE ON RADIUS
½" DRAIN TO BILGE



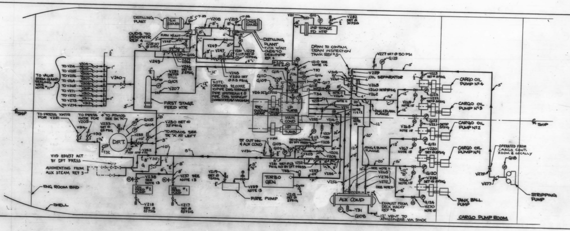
SKETCH "B"
DIAGRAM OF BOILER SAFETY VALVE ESCAPE

SEE SK "C"
ELECTRIC OPERATED SAFETY VALVE REF #2
½" SAT ST VENT (REF #2)
1" SUPHTR CIRC
PILOT OPER SUPHTR SAFETY V. (REF #2)
DRUM PILOT SAFETY V. REF 2
BOILER DRUM SAFETY VALVES REF #2
PORT BOILER
STBD BOILER
TO ATMOS VIA STACK
1" DRAIN TO BILGE



SKETCH "A"
DIAGRAM OF MISC REL VALVES TO ATMOS

10" TO ATMOS VIA STACK
V233 D.F.T. RELIEF
V230 EXH ST MN
V507 STEAM TO F.O. HTRS REF #3
V81 ST TO 4TH STAGE FD HTR REF #3
V144 STEAM TO TK CLN HTR REF #3
V149 ST TO STRIPPING PUMP REF #3
V78 STEAM TO AIR EJECTORS REF #3
V76 ST TO 5TH STAGE FD HTR REF #3
V79 ATOM. STEAM TO BOILERS REF #3
V397 40 PSI CONTAM ST REF #3
V77 AUX ST AUG TO CONTAM ST MN REF #3
V432 CONTAM ST GEN REF #3
1" DRAIN TO BILGE


DISTILLING PLANT
CNDS TO DESUPHTR REF 4
2ND STAGE FD HTR
DRAIN TO CONTAM DRAIN INSPECTION TANK REF #5
V227 SET @ 50 PSI
OIL SEPARATOR
FIRST STAGE FEED HTR
D.F.T.
AUGMENTING FROM AUX STEAM REF 3
V119 850/57 ACT BY DFT PRESS
TURBO GEN
FIRE PUMP
AUX COND
EXHAUST FROM DECK MACHY REF #5
12" VENT TO ATMOSPHERE VIA STACK
ENG ROOM BHD
SHELL
CARGO OIL PUMP No 4
CARGO OIL PUMP No 3
CARGO OIL PUMP No 2
CARGO OIL PUMP No 1
TANK BALL PUMP
STRIPPING PUMP
OPERATED FROM CARGO CONT ROOM & LOCALLY
CARGO PUMP ROOM
SHIP

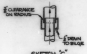
6451-471

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

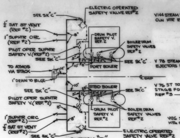
FRAME 2

10X



$\frac{3}{16}$" CLEARANCE ON RADIUS
$\frac{1}{2}$" DRAIN TO BILGE

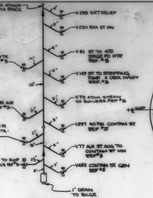
SKETCH "C"
SLIP JOINTS FOR SAFETY VALVE ESCAPE



SEE SK "C"
ELECTRIC OPERATED SAFETY VALVE REF#2
$\frac{1}{2}$" SAT ST VENT (REF #2)
1" SUPHTR CIRC (REF #2)
DRUM PILOT SAFETY V. REF. 2
PILOT OPER SUPHTR SAFETY V.(REF#2)
BOILER DRUM SAFETY VALVES REF#2
SEE SK "C"
PORT BOILER
TO ATMOS VIA STACK
1" DRAIN TO BILGE
℄ SHIP
STBD BOILER
SEE SK "C"
PILOT OPER SUPHTR SAFETY V.(REF.#2)
DRUM PILOT SAFETY V. REF.#2
BOILER DRUM SAFETY VALVES REF#2
1" SUPHTR CIRC (REF#2)
$\frac{1}{2}$" SAT ST VENT (REF#2)
SEE SK "C"
ELECTRIC OPERATED SAFETY VALVE REF#2
10"
8"
5"

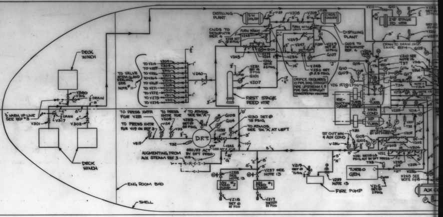
SKETCH "B"

DIAGRAM OF BOILER SAFETY VALVE ESCAPE

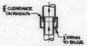


10" TO ATMOS VIA STACK
V233 D.F.T RELIEF
V230 EXH ST MN
V144 STEAM TO TK CLN HTR REF#3
V81 ST TO 4TH STAGE FD HTR REF.#3
V149 ST TO STRIPPING PUMP & DECK MACHY REF.#3
V79 ATOM. STEAM TO BOILERS REF#3
V 78 STEAM TO AIR EJECTORS REF#3
V397 40 PSI CONTAM ST REF #5
V 76 ST TO 5TH STAGE FD HTR REF#3
V77 AUX ST AUG TO CONTAM ST MN REF#3
V126 ST TO SLOP HTG COILS REF#3
V452 CONTAM ST GEN REF #5
1" DRAIN TO BILGE
4"
8"
10"
6"
2"
3"
2$\frac{1}{2}$"

SKETCH "A"
DIAGRAM OF MISC REL. VALVES TO ATMOS

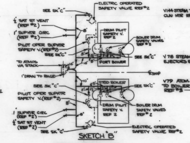


℄ SHIP
$\frac{1}{2}$" WARM UP LINE SEE REF#3
DECK WINCH
V300
V316
$\frac{1}{2}$" DRAIN
V317
V301
V302
DECK WINCH
TO VALVE STEM GLAND SEALING SEE NOTE#11
TO V214
TO V255
TO V256
TO V264
TO V265
TO V271
TO V272
TO V273
TO V274
V304
V305
V306
V307
V308
V309
V310
V311
V312
V240
DISTILLING PLANT
SW COOLER
CNDS COOLER
CNDS TO DESUPHTR REF. 4
FURN W/UNIT
FURN WITH UNIT
V245
V228 SET @ 10 PSIG
V243
V281 SET @ 15 PSIG
G101
V207
G106
V244
V246 SET @ 8.5 PSIG
V249
V247
V234
V229 SET @ 10 PSIG
G107
V248
V250 SET @ 5.5 PSIG
ORIFICE REQUIRES 10 PIPE DIAS STRAIGHT PIPE UPSTREAM & 5 PIPE DIAS STRAIGHT DOWNSTREAM MINIMUM
V208
V209
DISTILLING PLANT
CNDS TO DESUPHTR REF. 4
FIRST STAGE FEED HTR
TO PRESS XMTR FOR V251
TO PRESS XMTR FOR V208
TO PRESS XMTR FOR V119 ON REF 3
V315
V314
V313
TO ATMOS SEE SK "A"
V233 SET @ 85 PSIG
G105
G104
V235
D.F.T.
T32
V242
V230 SET @ 75 PSIG
TO ATMOS SEE SK "A" AT LEFT
AUGMENTING FROM AUX STEAM REF. 3
850/57 ACT BY DFT PRESS
V119
V238 SEE NOTE 13
V237 SEE NOTE 13
MN FEED PUMP #2
MN FEED PUMP #1
V218 SET @ 85 PSIG
V217 SET @ 85 PSIG
V219 SET @ 75 PSIG
V239 NOTE 13
FIRE PUMP
ENG ROOM BHD
SHELL
V211
G111
V232 SET @ 30 PSIG
2ND STAGE FD HTR
V226
V257
DRAIN TO DRAIN INSP. TANK REF#4
G125
V210 SEE NOTE 14
T37
G116
G117
G115
G114
G110
G109
V216 SET @ 2 PSIG
T34
RE-DUCTION GEAR
TURB CROSS OVER
LP TURB
MAIN COND
HP TURB
V255
V214
V201
T35
G113
G112
ST OUT MN & AUX COND
V286
G103
G102
V205
V203
V202
V204
V251 SET @ 63 PSIG ACT BY DFT PRESS
V252
V253
V254
T33
TURBO GEN
V256
V265 SEE NOTE 11 & 18
V215 SET @ 2 PSIG
AUX CO
ENG
"D"
"G"
"E"
"F"
"J"
"K"
"L"
"M"
"N"



$\frac{3}{16}$" CLEARANCE ON RADIUS
$\frac{1}{2}$" DRAIN TO BILGE

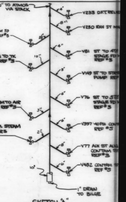
SKETCH "C"
SLIP JOINTS FOR SAFETY VALVE ESCAPE



SEE SK "C"
ELECTRIC OPERATED SAFETY VALVE REF#2
$\frac{1}{2}$" SAT ST VENT (REF #2)
1" SUPHTR CIRC (REF #2)
DRUM PILOT SAFETY V. REF 2
BOILER DRUM SAFETY VALVES REF#2
PILOT OPER SUPHTR SAFETY V.(REF#2)
SEE SK "C"
PORT BOILER
TO ATMOS VIA STACK
1" DRAIN TO BILGE
℄ SHIP
STBD BOILER
SEE SK "C"
PILOT OPER SUPHTR SAFETY V.(REF#2)
DRUM PILOT SAFETY V. REF 2
BOILER DRUM SAFETY VALVES REF#2
1" SUPHTR CIRC (REF #2)
$\frac{1}{2}$" SAT ST VENT (REF#2)
SEE SK "C"
ELECTRIC OPERATED SAFETY VALVE REF#2
10"
8"
5"

SKETCH "B"

DIAGRAM OF BOILER SAFETY VALVE ESCAPE



10" TO ATMOS VIA STACK
V233 D.F.T. RELIE
V230 EXH ST MN
V507 STEAM TO F.O. HTRS REF#5
V81 ST TO 4TH STAGE FD REF#3
V144 STEAM TO TK CLN HTR REF#3
V149 ST TO STR PUMP REF
V76 ST TO 5TH STAGE FD REF#3
V 78 STEAM TO AIR EJECTORS REF#3
V397 40 PSI CONT REF #5
V79 ATOM. STEAM TO BOILERS REF#3
V77 AUX ST AUG CONTAM S REF#3
V452 CONTAM S REF#5
1" DRAIN TO BILGE

SKETCH "A"
DIAGRAM OF MISC REL VALVES TO ATMOS

6451-471

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 3

6451-472

CSD [redacted] VAULT X-182

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APP'D.
–	–	SEE SHEET 2	–	–	–	–

REV. STATUS OF SHEETS													
REV.	K	K	A	F	E	K	G	E	K	G	G	H	J
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	10A

REV.
SHEET

GROUP
MC NO.

FOR ARR SEE NN DWG Nº 6451-471

DWG. REV. — HULL APPLIC.

REV.	NN HULLS ONLY 613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	YES
E	YES	YES	YES
F			YES
G	YES	YES	YES
H	YES	YES	NO
J	YES	YES	NO
K	YES	YES	NO

NNS & DD Co. HULL NO.	MARAD HULL NO.	USMA DESIGN	SHIP'S NAME
615C	311	-	
614C	310		
613C	309	T11-S-116A	

APPROVALS

OWNERS ZAPATA LTR DTD 6 DEC 75
SHELL LTR DTD 17 DEC 75

ABS NOT REQ'D

USCG (MMT)
LTR 5940 DTD 26 FEB 75

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

FSCM NO. 43689

— DESIGN DIVISION DEPT. MACHINERY DESIGN

GROUPED BY CHK.
DATES COMP. PART
HULL — GROUP NO. KEY
TYPE OF DWG. —

REPRODUCTION OFFICE

YARD PRINTS YES GROUPING NO
REMARKS Rev "K"
DATE 3-30-9? SIGNED J H Johnson

SPECIAL PRINTS

REV.	DATE ISSUED
	9-16-75
	10-24-75
E	9-28-77
F	11-21-77
H	12-11-78
J	2-12-79
K	4-4-79

YARD PRINTS

FIRST ISSUE	DEPT.	NO. PRINTS
	AH	
	BL	
	BR	
	EL	
	FP	
9-28-77	MI	2
	ML	
	MS	
12-11-78	PC	1
	PM	
9-28-77	PS	12
	PN	
	RD	
	RM	
	MIR	
	SH	
	SM	
	TM	
	WD	
	WE	
	WM	
	X16	

ORDERED BY DESIGN

FIRST ISSUE	DEPT.	NO. PRINTS
9-28-77	SEPIA/RO	1
	JHJ	1
	VRS	1
	CSD-V	1
	LWC	1
	E34	1
	RGH	1
	E11	1
	K50	1
	OR SHELL	2
	~~OR ZAPATA~~	2
11-21-77	USCG (LOCAL)	2
	ABS (LOCAL)	2
3-30-9	MAIL	5

SCALE: NONE = 1 Ft.
DRAWN: D.L. HOFFMAN
CHECKED: H.M. EDGE
SECT. MGR. J H Johnson

DATE COMPL. 11-12-74
EXAMINED:
AUTHORIZED: EBF
DATE 11-19-74

TECH. APPROVAL HWS SAW 11/15/74 VRS 11/18/74 [illegible] 11/18/74

CSD APPROVAL J.R. Thompstead

TITLE
DIAGRAM
AUX EXH, BLEED ST & RELIEF VALVE ESCAPE
LIST

DWG. NO. 6451-472
REVISION K
SHEET NO. 1 OF 12

M7 11 X 17

6451-472

MICRO-MASTER® 105 mm
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REVISIONS

COST CHG NO. NN	COST CHG NO. OWNER	REV	SH NO.	LINE NO.	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
—	—	A	—	—	INITIAL ISSUE	11/19/4	JKJ	—	—
X	X	B	6 7	- -	SIZE V-206 WAS 18", V207, V208 & V209 WAS 14" SIZE V-234 WAS 14", V-243, V244 & V246 WAS LATER & V-245 WAS 5".	7/9/75	JKJ	—	—
			8	-	SIZE V247, V248 & V250 THRU V253 WAS LATER AND V249 WAS 5".				
			12	-	FLOW DATA TABLE ALT TO SUIT DSTL PLANT ST REQUIREMENT ALT FROM 16000 TO 4,210 #/HR THE ABV TO SUIT CHANGE IN DSTL REQUIREMENTS.				
			1		APPROVAL LTR NOTED				
—	—		6		DELETED V-212 TO SUIT DESIGN DEV. H.M.E.				
#40 FOR H-613C H-614C	Later		6 8,9 & 4		DELETED FOR H-613C & H614C MOTORS FROM VALVES V213, V255, V256, V265, V271 V-272, V-273, & V274. NOTE 12 ALT TO SUIT.				
#11 FOR H-613C H-614C	Later		9 11		DELETED FOR H-613C & 614C V276 & V278 & GAGE G-119 TO SUIT DELETION OF STRIPP. PUMP No 2. H.M.E				
#12 H613C H614C	—	C	7		V225 & V226 MARKED "H615C ONLY"	9/3/5	HVS 9-4-75 JKJ		
—	—		7		V236 ADDED				
#12 H613C H614C	—		8		V257 & V258 MARKED "H615C ONLY"				
—	—		8		SIZE OF V259 THRU V265 UPDATED				
—	—		9		SIZE OF V275 THRU V278 CHANGED FROM 6" TO 5", V291 CHANGED FROM 5" TO 6" AND V279 THRU V290 DELETED TO SUIT LATEST DECK MACHY & STRIPPING PUMP VENDOR INFO				
#12 H613C H614C	—		9		V291 & V292 MARKED "H615C ONLY"				
↓	—		10		V293 THRU V302 MARKED "H615C ONLY"				
—	—		10		V294 THRU V302 CHANGED FROM 5" TO 6" TO SUIT LATEST DECK MACHY VENDORS INFO V313, V314 & 315 ADDED				
—	—		11		T38 & T39 ADDED				
#12 H613C H614C			12		DK MACHY EXH MARKED "H615 ONLY"				
—	—		12		DESIGN CHARACTERISTICS FOR DK MACHY EXHAUST UP DATED				
20	-	D	6	-	V213 DELETED.	10/17/5	JKJ		
↓	-		9	-	SIZE V272 & V274 WAS 20" & 16"				
	-		10	-	V303 DELETED				
	-		11	-	G-108 WAS 0-30"				
↓	-		4	-	V213 DELETED FROM NOTE #11. RBW				
—	—	E	5	-	BOLTING FOR AUX EXH & LP TURB BLEED ST WAS BOLT STUD ALLOY STL.				
—	—		6		V206 WAS 14" DUCTILE IRON 125#. H.M.E				
—	—		12		TG EXHAUST FLOW WAS 18.800 & VEL WAS 665 FPS				
			11		ADD RANGE FOR T38 & T39				
			9		ADD VALVES V279 & V280 H.M.E				
—	—	E	4	—	ALTERED WORDING NOTE #15 & ADDED NOTE # 18. ERS	9/16/7	AC JKJ	—	—
			7 8	- -	ADDED SIZE FOR V228, V229, V230 & V233 CORRECTED SIZE V263 WAS 8" TES				
			6	-	ADDED SIZE FOR V 215. & V217. ADDED SIZE & CHANGED MAT'L FOR V220 THRU V223.				
			7		UPDATED MAT'L FOR V224. & V233				
			9		ADDED V281 WDB				
			11		G-113 MADE APPLICABLE TO 615C ONLY WDB				
—	—	F	9 4	-	ADDED VLVS V5058 & V5059 FOR H615C ADDED NOTE 19	11/7/7	AC JKJ	—	—
			9	-	ADDED V316 & V317 FOR H615C				
—	—	G	6 7 9 12		ADDED RELIEF PRESS SET. TO V217, V218, V219 ALT'D SIZE OF V239, WAS 5" ADDED V-318 FLOW DATA TABLE; ALT'D SYM "N" WDG	10/5/8	JKJ		
			10		MADE V-315 APPLICABLE TO H615C ONLY				
			6 7 11		ADDED SIZE FOR V216 ADDED RELIEF VALVE SETTING FOR V231 & V232 ADDED NORMAL TEMP FOR T31 & T34				
			12		DESIGN CHARACTERISTICS TABLE: ADDED SYMBOL ◐ TO HYDRO TEST PRESS. ADDED "SERVICE" TO HYDRO TEST PRESS FOR T-G SET EXHAUST.				
—	—	H	12		SYM J SIZE, FLOW #HR, VEL FT/SEC & SERVICE WAS 14, 20,200; 189 & 1ST STAGE FD HTR RESP SYM L FLOW #HR, YEL FT/SEC & COND. WAS 4210/2640; 106/66 & 12,100 GPD RESP SYM "N" SIZE FLOW #/HR & VEL WAS 5"; 7,500 & 83 RESP. LAM	12/6/8	AC JKJ		
—	—	J	10A		ADDED SHEET 10 A (V315) LAM	2/6/9	AC JKJ		
			11		ADDED NORMAL TEMP FOR T38 & T39				
		K	9		ALT'D SERVICE FOR V271 & V273, SERVICE WAS CARGO P. #3 & #4 AND CARGO P #1 & #2 RESPECT. WDG	3/30/79			
			6		V-205 SIZE WAS 2"				

HULL NO. 613C, 614C, 615C	DWG. NO. 6451-472	REV. K
		SHEET 2

K&E 19 1253 10-71 2236•

MN11-11 X 17 (REV. 1)

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216555

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REFERENCES			
NO.	TITLE		DWG NO.
1	CONTRACT GUIDANCE DIAGRAM OF EXHAUST STEAM SYSTEM		216555
2	DIAG MN ST SYSTEM - ARR		6440-505
3	DIAG AUX ST SYSTEM - ARR		6450-683
4	DIAG CNDS, RES & MAKE-UP FD SYSTEM - ARR		6552-380
5	DIAG CONTAM ST GEN SYS - ARR		6450-692
6	TYP ARR OF GAGE PIPING		6750-481
7	DIRECTIONS FOR INSULATING & LAGGING OF PIPES & AUX IN E.R.		257323
8	PP ARR MISC INSTRUMENTS IN ENG RM		6755-67
9	FABRICATION & WELDING INSTRUCTIONS FOR CL 1 & II PIPING SYS		257035

DIAG - AUX EXH, BLEED ST & RELIEF VALVE ESCAPE - LIST	HULL NO.613C,614C,615C	DWG. NO. 6451-472	REV. A
			SHEET 3

K&E 19 1253 10-71 2236•

MN12-11 X 17 (REV. 1)

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GENERAL NOTES

1. ALL PIPE SIZES SPECIFIED ARE NOMINAL I.P.S. OUTSIDE DIAMETER.
2. MANUFACTURING PROCEDURES AND MATERIAL CERTIFICATION FOR PIPES, VALVES AND FITTINGS ARE TO BE IN ACCORDANCE WITH U.S. COAST GUARD AND AMERICAN BUREAU OF SHIPPING RULES.
3. THE THICKNESS SHOWN IN THE "CALCULATED MIN. THK." COLUMN OF THE PIPE LIST IS THE MINIMUM THICKNESS ALLOWABLE AFTER ALL END PREPARATION IS COMPLETED AND IS IN ACCORDANCE WITH U.S. COAST GUARD MINIMUM THICKNESS REQUIREMENTS.
4. PIPES MAY BE BENT TO A MINIMUM RADIUS OF 5 I.P.S. DIAMETERS.
5. VALVES MARKED THUS ON THE FACE OF THE PLAN SHALL BE INSTALLED AS FOLLOWS:

FLUID ON THIS SIDE IS
ISOLATED FROM STEM
PACKING WITH VALVE CLOSED.

FLUID ON THIS SIDE IS
IN CONTACT WITH STEM
PACKING WITH VALVE CLOSED.

6. LETTERS "A," "B" AND ETC. SHOWN ON PIPE RUNS ARE FOR USE WITH FLOW TABLE ON SHEET 12.
7. GAGE PIPING SHALL BE IN ACCORDANCE WITH REFERENCE #6.
8. INSULATION AND LAGGING REQUIREMENTS SHALL BE IN ACCORDANCE WITH REFERENCE #7.
9. EXHAUST STEAM SYSTEM RELIEF AND SENTINEL VALVES NOT SHOWN IN SKETCH "A" ARE TO DISCHARGE LOCALLY. THEIR TAILPIPES ARE TO TERMINATE SO THAT DISCHARGE WILL NOT DAMAGE EQUIPMENT OR INJURE PERSONNEL.
10. THE STOP CHECK VALVES IN THE MAIN TURBINE BLEEDS ADJACENT TO THE TURBINES ARE TO BE OF THE PISTON, NON-SHOCK TYPE.
11. VALVES V214, V255, V256, V264, V265, V271, V272, V273 AND V274 ARE TO HAVE STEAM SEALED GLANDS SUPPLIED BY THE AUXILIARY EXHAUST.
12. THE SHIP SERVICE TURBO GENERATOR SHALL HAVE REMOTE START/STOP CONTROL FROM THE ENGINE ROOM CONTROL CENTER. VALVE V214 IS ~~HULL 615C) (V214 FOR H613C & 614C) ARE~~ TO HAVE OPEN/CLOSE PUSH BUTTONS AND POSITION INDICATOR LIGHTS FOR OPERATION AT THIS LOCATION.
13. EACH MOTOR OPERATED MAIN FEED PUMP AND FIRE ~~AND TANK CLEANING~~ PUMP EXHAUST VALVE SHALL BE OPERATED AUTOMATICALLY BY THE PUMP CONTROLLER (SEE REF. 8) AND SHALL HAVE POSITION INDICATOR LIGHTS ON THE MAIN CONSOLE.
14. MOTOR OPERATED TURBINE BLEED VALVES SHALL BE OPERATED BY THE CENTRALIZED CONTROL SYSTEM AS DESCRIBED IN REFERENCE 8 AND SHALL HAVE POSITION INDICATOR LIGHTS ON THE MAIN CONSOLE.
15. MOTOR OPERATED VALVES IN THE CARGO AND BALLAST PUMP EXHAUSTS SHALL HAVE OPEN/CLOSE PUSH BUTTONS AND POSITION INDICATOR LIGHTS ON A PANEL LOCATED NEAR THE STEAM CUT OUT VALVES, V-14, V15, V-16, V-17, & V-18 ON REFENCE #2.
16. ALL MOTOR OPERATED VALVES SHALL HAVE HANDWHEELS FOR LOCAL OPERATIONS.
17. WAFER CHECK VALVES ARE TO BE "MISSION DUO CHECK" AS MANUFACTURED BY MISSION MFG. CO. OF HOUSTON TEXAS OR EQUAL.
18. MOTOR OPERATED STRIPPING PUMP AND DECK MACHINERY EXHAUST VALVES AT CONDENSERS (V-264 & V-265 FOR H-615C)(V-264 FOR H-613C & H-614C) SHALL HAVE OPEN/CLOSE PUSH BUTTONS AND POSITION INDICATOR LIGHTS ON A PANEL LOCATED NEAR V-260.
19. (615C) DECK EXHAUST MAINS SHALL BE FITTED WITH 3/4" LOW POINT DRAIN VLVS. TO ALLOW COMPLETE DRAINAGE OF THOSE PORTIONS SUBJECT TO FREEZING.

HULL NO. 613C, 614C, 615C	DWG. NO. 6451-472	REV. F
		SHEET 4

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MATERIAL SCHEDULE

SERVICE	ITEM	TYPE	SIZE	MATERIAL	APPLICABLE DOCUMENTS
AUX EXH SYS, CROSSOVER & L.P. TURB BLEEDER STEAM	PIPING	SEAMLESS	ALL	CARBON STEEL	ASTM A53-73, GR - B
	FITTINGS	FLANGED	2" & ABV	CAST CARBON STEEL	ANSI B16.5-73 150#
		BUTT WELDING		FORGED CARBON STEEL	ANSI B16.9-71 SCH 40
		WELDED BRANCH		CARBON STEEL	ASTM A53-73, GR - B AS DELINEATED BY REF 9
		THREADED	1-1/2" & BEL	MALLEABLE IRON	ANSI B16.3-71 150# ASTM A197-71
	JOINTS	FLANGES SLIP-ON	2" & ABV	CARBON STEEL	ANSI B16.5-73 150#
		UNIONS THREADED	1-1/2" & BEL	MALLEABLE IRON	ANSI B16.3-71 300# ASTM A197-71
	GASKETS	SHEET	ALL	COMP ASBESTOS	COMMERCIAL 1/16" THK
CROSSOVER TURB BLEEDER STM	FLANGE BOLTING	BOLT STUD	ALL	ALLOY STEEL	ASTM A193-74 GR B7 OR EQUAL
		NUTS-HVY HEX		STEEL	ASTM A194-73 GR 4 OR EQUAL
ESCAPE PIPING	PIPING	SEAMLESS OR WELDED	ALL	CARBON STEEL	ASTM A53-73 GR - B
	FITTINGS	BUTT WELDING	ALL	FORGED CARBON STEEL	ANSI B16.9-71 SCH 40
		WELDED BRANCH		CARBON STEEL	ASTM A53-73 GR B AS DELINEATED BY REF 9
	JOINTS	FLANGES SLIP-ON	ALL	CARBON STEEL	ANSI B16.5-73 150#
	GASKETS	SHEET	ALL	COMP ASBESTOS	COMMERCIAL 1/16" THK
ESCAPE PIPING AUX EXH & LP TURB BLEED STEAM	FLANGE BOLTING	BOLTS-HVY HEX HEAD	ALL	STEEL	ANSI B1.1-60 (THREADS)
		NUTS-HVY HEX		↓	ANSI B18.2.1-72 (HEX HEADS) ANSI B18.2.2-72 (HEX HEADS)

*SEE NOTE 3

REMARKS

PIPE LIST

SERVICE	NOM. SIZE	CAL. MIN. THK*	ORDERED THK	SCHEDULE NO.
AUXILIARY EXHAUST, L.P. TURBINE BLEED	30	.125	.375	STD
	24	.100	.375	
	20	.083	.375	
	14	.058	.375	
	12	.053	.375	
	10	.045	.365	
	8	.036	.322	
	6	.028	.280	
	5	.023	.258	
	4	.019	.237	
	1	.070	.133	
	16	.066	.375	↓
	3/4	.069	.154	X-STRONG
	1/2	.068	.147	↓
ESCAPE PIPING	12	.066	.375	STD
	10	.065	.365	
	8	.045	.322	
	6	.034	.280	
	5	.029	.258	
	4	.023	.237	
	3	.083	.216	
	2	.077	.154	↓

HULL NO. 613C, 614C, 615C	**DWG. NO.** 6451-472	
	REV. E	**SHEET** 5 **OF**

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V201	1	4"	ANGLE STOP CHECK	CARBON STEEL	B16.5 150#	FLG ANSI B16.5	BRONZE	CROSS-OVER BLEED CUT-OUT	SEE NOTES 10, 14 & 16 MOTOR OPERATED	ASTM A-216 GR WCB
	V202	1	4"	GATE					REG. V. IN		
	V203	1	4"	↓					OUT		
	V204	1	4"	GLOBE STOP					BYPASS		
K	V205	1	4"	REGULATING V.		↓	↓		↓	AIR PILOT OPERATED SET AT 60 PSIG	
E	V206	1	10"	ANGLE STOP CHECK	↓	B16.5 300#	FLG ANSI B16.5		LP TURB BLEED CUT-OUT	SEE NOTE 10, 14 & 16 MOTOR OPERATED	↓
	V207	1	12"	GATE	* CAST IRON	B16.1 125#	FLG ANSI B16.1		TO 1ST STG FD HTR		ASTM A·126
	V208	1	8"						TO DIST. PLANT (SW COOLED)		
	V209	1	8"	↓	↓				↓ (CNDS COOLED)		↓
	V210	1	8"	ANGLE STOP CHECK	* DUCTILE IRON				BLEED CUT-OUT	SEE NOTE 10, 14 & 16 MOTOR OPERATED	ASTM A·395 OR A·445
	V211	1	8"	GATE	*CAST IRON				↓ TO 2ND STG. FD. HTR.		ASTM A·126
	~~V212~~		~~24"~~	↓	~~*DUCTILE IRON~~	↓	↓	↓	~~TURBO GEN EXH~~	SEE NOTE 12 & 16 MOTOR OPERATED	~~ASTM A 395 OR A445~~
D	~~V213~~	~~1~~	~~24"~~	~~GATE~~	~~*DUCTILE IRON~~	~~B16.1 125#~~	~~FLG ANSI B16.1~~	~~BRONZE~~	~~TURBO GEN EXH TO AUX. CONDSR~~	↓ ↓ ▲ SEE NOTE 11	~~ASTM A395 OR A445~~
	V214	1	24"	GATE	*DUCTILE IRON	B16.1 125#	FLG ANSI B16.1	BRONZE	TURBO GEN EXH TO MN CONDSR	SEE NOTE 12 & 16 MOTOR OPERATED SEE NOTE 11	ASTM-A395 OR A445
F	V215	1	$\frac{1}{2}$"	SENTINEL RELIEF	SST	-	THD ANSI B16.15-250#	SST	↓	FURN W/TURBO GEN SET @ 2PSIG	303 OR 316 SST
G	V216	1	3"		BRONZE	-		BRONZE	L.P. TURB	TURB ↓	ASTM B61 OR B62 SEE NOTE 2
F	V217	1	1"			-			MN. FD P. #1 TURB.	PUMP 85 PSIG	
F	V218	1	1"			-			↓ #2	↓	
G	V219	1			↓	-		↓	FIRE ~~& TK. CLN.~~ P. TURB	75PSIG	↓
F	V220	1	$\frac{3}{4}$"		SST	-		SST	C.O. PUMP #1 TURB	5PSIG	—
F	V221	1				-			#2		—
F	V222	1				-			#3		—
F	V223	1	↓	↓	↓	-	↓	↓	↓ #4	↓	--

* CARBON STEEL MAY BE SUBSTITUTED FOR DUCTILE IRON & CAST IRON
▲ MOTOR OPERATED FOR H-615 ONLY.

HULL NO. 613C, 614C, 615C	DWG. NO. 6451-472	
	REV. K	SHEET 6 OF

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
F	V224	1	1/2"	SENTINEL RELIEF	SST	-	THD ANSI B16.15 250#	SST	BALLAST P. TURB.	FURN W/PUMP SET @ 5PSIG	
	V225 ⊗	1	1/2"	↓	↓	-	↓	↓	FWD. DECK MACHY EXH	SET AT 50 PSIG	ASTM B61 OR B62 SEE NOTE 2
	V226 ⊗	1	1/2"	↓	↓	-	↓	↓	AFT ↓ ↓ ↓	↓	↓
	V227	1	1/2"	↓	↓	-	↓	↓	EXH. FROM STRIPPING PUMPS	↓	↓
E	V228	1	4"x4"	RELIEF	* CAST IRON	B16.1 125#	FLG ANSI B16.1	↓	EXH. TO DIST PLANT (SW COOLED)	10 PSIG	ASTM-A-126
E	V229	1	4"x4"	↓	↓	↓	↓	↓	↓ ↓ ↓ ↓ (CNDS COOLED)	↓	↓
E	V230	1	6"x8"	↓	CARBON STEEL	B16.5 150#	FLG ANSI B16.5	↓	EXH. MAIN	75 PSIG	ASTM A-216 GR WCB
G	V231	1	1/2"	SENTINEL RELIEF	BRONZE	-	THD ANSI B16.15 250#	↓	1ST STAGE FD. HTR SHELL	15 PSIG	ASTM B61 OR B62 SEE NOTE 2
G	V232	1	1/2"	↓	↓	-	↓	↓	2ND ↓ ↓ ↓ ↓	30 PSIG	↓
F	V233	1	4"x4"	RELIEF	↓	B16.5 150#	FLG ANSI B16.5	↓	DFT. SHELL	85 PSIG	↓
	V234	1	8"	WAFER CHECK	* CAST IRON	B16.1 125#	FLG ANSI B16.1	↓	L.P. BLEED TO DSTL PLANTS	SEE NOTE 17	ASTM A-126
	V235	1	10"	↓	CARBON STEEL	B16.5 150#	FLG ANSI B16.5	↓	AUX. EXH. TO DFT.	↓	ASTM A216 GR WCB
	V236	1	3/4"	GLOBE STOP	BRONZE	—	THD ANSI B16.15 250#	↓	MN CONDSR STEAM OUT	WALWORTH FIG 160 OR EQUAL	ASTM B61 OR B62 SEE NOTE 2
	V237	1	8"	BACK PRESS & REL. VALVE	CARBON STEEL	B16.5 150#	FLG ANSI B16.5	BRONZE	MAIN FEED PUMP #1 EXH.	MOTOR OPERATED SEE NOTE 13 & 16	ASTM A216 GR WCB
	V238	1	8"	↓	↓	↓	↓	↓	↓ ↓ ↓ #2	↓	↓
G	V239	1	8"	↓	↓	↓	↓	↓	FIRE ~~& TK. CLN.~~ P. EXH	↓	↓
	V240	1	1"	GLOBE STOP	BRONZE	-	THD ANSI B16.15 250#	↓	GATE VALVE SEALING	WALWORTH FIG 160 OR EQUAL	ASTM B61 OR B62 SEE NOTE #2
	V241	1	3/4"	↓	↓	-		↓	AUX CONDSR STEAM OUT	↓	↓
	V242	1	10"	GATE	CARBON STEEL	B16.5 150#	FLG ANSI B16.5	↓	EXH. TO DFT.		ASTM A216 GR WCB
	V243	1	3"	↓	↓	↓	↓	↓	EXH. TO DIST.PLANT(S.W.CLD) RED.V. IN		↓
	V244	1	↓	↓	↓	↓	↓	↓	↓ OUT		↓
	V245	1	↓	GLOBE STOP	↓	↓	↓	↓	↓ BY-PASS		↓
	V246	1	↓	PRESS. RED.	↓	↓	↓	↓	↓	SET AT 5.5 PSIG	↓

* CARBON STEEL OR DUCTILE IRON MAY BE SUBSTITUTED FOR CAST IRON.

⊗ H61SC ONLY

HULL NO. 613C, 614C, 615C	DWG. NO.	6451-472	
	REV. G	SHEET 7 OF	

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V247	1	3"	GATE	CARBON STEEL	B16.5 150#	FLG ANSI B16.5	BRONZE	EXH. TO DIST PLT. (CNDS CLD) RED V. IN		ASTM A216 GR WCB
	V248	1	↓	GATE	↓	↓	↓	↓	↓ OUT		↓
	V249	1	↓	GLOBE STOP	↓	↓	↓	↓	↓ BY-PASS		↓
	V250	1	↓	PRESS. RED.	↓	↓	↓	↓	↓	SET AT 5.5 PSIG	↓
	V251	1	↓	EXH. DUMP	↓	↓	↓	↓	EXH. DUMP VALVE TO CONDSRS	AIR PILOT OPERATED UNLOAD AT 63 PSIG	↓
	V252	1	↓	GATE	↓	↓	↓	↓	↓ IN		↓
	V253	1	↓	↓	↓	↓	↓	↓	↓ OUT		↓
	V254	1	6"	GLOBE STOP	↓	↓	↓	↓	↓ BYPASS		↓
	V255	1	8"	GATE	↓	↓	↓	↓	EXH. DUMP TO MN. CONDSR	MOTOR OPERATED SEE NOTE 11 & 16 ▲	↓
	V256	1	8"	↓	↓	↓	↓	↓	↓ AUX ↓	↓ ↓	↓
	V257 ⊗	1	8"	↓	↓	↓	↓	↓	AFT DK MACHY EXH CUT-OUT		↓
	V258 ⊗	1	8"	↓	↓	↓	↓	↓	FWD ↓		↓
	V259	1	⊗10" △5"	↓	↓	↓	↓	↓	EXH OIL SEPARATOR INLET		↓
	V260	1	⊗10" △5"	BACK PRESS. REG.	↓	↓	↓	↓	STRIP. P. [illegible]. EXH. REG. V.	SET AT 8 PSIG	↓
	V261	1	⊗10" △5"	GATE	↓	↓	↓	↓	↓ IN		↓
	V262	1	⊗10" △5"	↓	↓	↓	↓	↓	↓ OUT		↓
E	V263	1	⊗10" △4"	GLOBE STOP	↓	↓	↓	↓	↓ BYPASS		↓
	V264	1	⊗14" △8"	GATE	↓	↓	↓	↓	↓ TO MN. CONDSR	SEE NOTE 11 & 16 MOTOR OPERATED	↓
	V265	1	⊗14" △8"	↓	↓	↓	↓	↓	↓ AUX ↓	SEE NOTE 11 & 16 ▲ MOTOR OPERATED	↓
	V266	1	12"	↓	↓	↓	↓	↓	EXH. FROM CARGO P. #1 TURB	MOTOR OPERATED SEE NOTES 15 & 16	↓
	V267	1	12"	↓	↓	↓	↓	↓	↓ #2	↓	↓
	V268	1	12"	↓	↓	↓	↓	↓	↓ #3	↓	↓
	V269	1	12"	↓	↓	↓	↓	↓	↓ #4	↓	↓

▲ MOTOR OPERATED FOR H615 ONLY
⊗ H615C ONLY
△ H613C & H614C ONLY

HULL NO. 613C, 614C, 615C	**DWG. NO.**	6451-472	
	REV. E	**SHEET** 8	**OF**

6451-472

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4X

VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V270	1	8"	GATE	CARBON STEEL	B16.5 150#	FLG ANSI B16.5	BRONZE	EXH. FROM BALL. PUMP TURB	MOTOR OPERATED SEE NOTE 15 & 16	ASTM A216 GR WCB
K	V271	1	20"	↓	↓ ↓	↓	↓	↓	CARGO P. #1 & 2 & BALL. PUMP EXH. TO MN. CONDSR.	MOTOR OPERATED SEE NOTE 11, 15 & 16 ▲	↓
D	V272	1	14"	↓	↓ ↓	↓	↓	↓	CARGO P. #3 & 4 & BALL. PUMP EXH. TO AUX. CONDSR.	↓ ↓	↓
K	V273	1	16"	↓	↓ ↓	↓	↓	↓	CARGO P: #3 & 4 EXH: TO MAIN CONDSR.	↓ ↓	↓
D	V274	1	12"	↓	↓ ↓	↓	↓	↓	CARGO P. #1 & 2 EXH. TO AUX. CONDSR	↓ ↓	↓
	V275	1	5"	↓	↓ ↓	↓	↓	↓	STRIP. PUMP #1 EXH.		↓
	V276 ⊗	1	5"	↓	↓ ↓	↓	↓	↓	↓ ↓ #2 ↓		↓
	V277	1	5"	SWING CHK	↓ ↓	↓	↓	↓	↓ ↓ #1 ↓		↓
	V278 ⊗	1	5"	↓ ↓	↓ ↓	↓	↓	↓	↓ ↓ #2 ↓		↓
E	V279	1	1/2"	GLOBE STOP	BRONZE	—	THD ANSI B16-15 250#	↓	SENSING FOR V-246	WALWORTH FIG 160 OR EQUAL	ASTM B61 OR B62 SEE NOTE 2
E	V280	1	1/2"	↓ ↓	↓	—	↓	↓	↓ ↓ V-250	↓	↓
F	V281	1	2"	VACUUM BREAKER	↓	—	↓	↓	VACUUM BREAKER FOR DFT	SET @ 4" HGV	↓
F	V316 ⊗	1	1/2"	GLOBE STOP	CARBON STL	B16.34 600#	SW ANSI B16.11		DK WENCH EXH DRAIN		ASTM-A105
F	V317 ⊗	1	1/2"	↓	↓	↓	↓	SST	DK WENCH EXH DRAIN		↓
G	V318	1	1/2"	↓	↓	↓	↓	↓	SENSING FOR V260		↓
F	V5058 ⊗	1	6"	GATE	CARBON/STL	B16.5 150#	FLG ANSI B16.5	BRONZE	DECK WINCH EXH		ASTM A216 GR WCB
F	V5059 ⊗	1	6"	↓	↓	↓	↓	↓	↓ ↓ ↓		↓
	V291 ⊗	1	6"	GATE	CARBON STEEL	B16.5 150#	FLG ANSI B16.5	↓	↓ ↓ ↓		ASTM A216 GR WCB
	V292 ⊗	1	6"	↓	↓ ↓	↓	↓	↓	↓ ↓ ↓		↓

▲ MOTOR OPERATED FOR H615 ONLY
⊗ H615C ONLY

HULL NO. 613C, 614C, 615C	DWG. NO. 6451-472
REV. K	SHEET 9 OF

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VALVE LIST

	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI CLASS	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V293 ⊛	1	6"	GATE	CARBON STEEL	B16.5 150#	FLG ANSI B16.5	BRONZE	DECK WINCH EXH. FWD		ASTM A216 GR WCB
	V294 ⊛	1	6"								
	V295 ⊛	1	6"								
	V296 ⊛	1	6"								
	V297 ⊛	1	6"								
	V298 ⊛	1	6"								
	V299 ⊛	1	6"								
	V300 ⊛	1	6"						AFT		
	V301 ⊛	1	6"								
	V302 ⊛	1	6"								
D	~~V303~~	~~1~~	~~1/2"~~	~~GLOBE STOP~~	~~BRONZE~~	~~-~~	~~THD ANSI B16.15 250#~~		~~GLAND SEAL TO V213~~	~~WALWORTH FIG. 160 OR EQUAL~~	~~ASTM B61 OR B62 SEE NOTE 2~~
	V304	1	1/2"	GLOBE STOP	BRONZE	-	THD ANSI B16.15 250#	BRONZE	GLAND SEAL TO V214	WALWORTH FIG. 160 OR EQUAL	ASTM B61 OR B62 SEE NOTE 2
	V305	1	1/2"			-			V255		
	V306	1	1/2"			-			V256		
	V307	1	1/2"			-			V264		
	V308	1	1/2"			-			V265		
	V309	1	1/2"			-			V271		
	V310	1	1/2"			-			V272		
	V311	1	1/2"			-			V273		
	V312	1	1/2"			-			V274		
	V313	1	1/2"			—			SENSING FOR V205		
	V314	1	1/2"			—			V251		
	V315 ⊛	1	1/2"			—			V119		

⊛ H615C ONLY

HULL NO.	613C, 614C, 615C	DWG. NO.	6451-472
	REV. G	SHEET 10 OF	

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VALVE LIST

REV	ITEM	NO PER SHIP	SIZE	TYPE	BODY MATERIAL	ANSI PRESS SERIES	END CONN	TRIM MATERIAL	SERVICE	REMARKS	MATL. SPEC.
	V315	1	1/2	GLOBE STOP	BRONZE	–	THD ANSI B16.5 250#	BRONZE	SENSING LINE CUT-OUT		ASTM B61 OR B62 SEE NOTE 2

HULL NO. 613, 614	DWG NO. 6451-472	REV. J
		SHEET 10A

K&E 181252 8-74 W 2647A

MN 18-11X17 (REV. 1)

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INSTRUMENT LIST

INST NO.	SERVICE	SIZE	RANGE	
G-101	FIRST STAGE FEED HTR SHELL	4 1/2"	30"-30#	
G-102	AUX EXH MAIN	4-1/2"	0-100#	
G-103*	↓ ↓ ↓	-	0-100#	
G-104	DFT SHELL	4-1/2"	0-100#	
G-105*	↓ ↓	-	0-100#	
G-106	AUX EXH TO DSTL PLANT (SW CLD)	4-1/2"	30"-30#	
G-107	↓ ↓ ↓ ↓ ↓ (CNDS CLD)	↓	30"-30#	
G-108	AUX CONDSR SHELL	↓	0-100#	Ⓓ
G-109	MN COND VACUUM	↓	0-30"	
G-110*	↓ ↓ ↓	-	0-30"	
G-111	SECOND STAGE FEED HTR SHELL	4-1/2"	0-30#	
G-112	MAIN TURB CROSS-OVER	4-1/2"	0-100#	
G-113⊛*	↓ ↓ ↓	-	↓	Ⓕ
G-114	L.P. LP BLEED	4-1/2"	30"-30#	
G-115*	↓ ↓	-	↓	
G-116	L.P. HP	4-1/2"	0-30#	
G-117*	↓ ↓ ↓ ↓	-	↓	
G-118	STRIPPING P. #1 EXH	4-1/2"	30"-300#	
G-119⊛	↓ ↓ #2 ↓	↓	↓	
G-120	CARGO PUMP #1 TURB. EXH	↓	30"-30#	
G-121	#2	↓	↓	
G-122	#3	↓	↓	
G-123	↓ ↓ #4 ↓ ↓	↓	↓	

*LOCATED IN E.O.S.
⊛ FOR HULL 615C ONLY
△ FOR H613C & H614C ONLY

INST NO.	SERVICE	NORMAL TEMP	RANGE °F	
T-31	AUX. CONDSR. (EXH)	212°F	50-500	Ⓖ
T-32	DFT (EXH)	308°F	50-500	
T-33	SSTG TURB EXH	120°F	0-300	
T-34*	L P TURBINE EXHAUST	92°	50-500	Ⓖ
T-35	MAIN TURBINE CROSS-OVER	470°F	150-750	
T-36	L.P. BLEED	200°F	50-300	
T-37	L.P. BLEED	275°F	50-500	
T-38	STEAM TO CONDENSATE COOLED DISTILLING PLANT	200°	20-240	
T-39	STEAM TO SEA WATER COOLED DISTILLING PLANT	↓	? ↓	

INST NO.	SERVICE	SIZE	RANGE
G-124	BALLAST PUMP TURB EXH	4 1/2"	30"-30#
G-125⊛	STRIP. PUMP & DK MACHY EXH MN	↓	30"-30#
G-125△	STRIP PUMP EXH MN	↓	↓

HULL NO. 613C, 614C, 615C,	DWG NO. 6451-472	REV. J
		SHEET 11

K&E 191253 8-74 W 2847A•

MN 13-11X17 (REV. 1)

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DESIGN CHARACTERISTICS

SERVICE	WORKING PRESS	WORKING TEMP	DESIGN* PRESS	DESIGN TEMP	HYDRO TEST PRESS ⊖
AUXILIARY EXHAUST	70 PSIG	308°F	75 PSIG	500°F	113 PSIG ◑
CROSSOVER BLEED TO AUX EXH	73 PSIG	465°F	73 PSIG	500°F	110 PSIG ◑
LP TURB BLEED TO 2ND STAGE FD HTR	13 PSIG	275°F	50 PSIG	300°F	75 PSIG ◑
↓ ↓ ↓ ↓ 1ST ↓ ↓ ↓	12 PSIA	200°F	50 PSIG	250°F	75 PSIG ◑
T-G SET EXHAUST	1.5 PSIA	120°F	50 PSIG	150°F	SERVICE
CARGO PUMPS & TK BALL PUMP EXH	9 PSIA	365°F	50 PSIG	400°F	30 PSIG ◑
DECK MACHY EXHAUST ⊛	30 PSIG	350°F	245 PSIG	400°F	368 PSIG
ESCAPE SYSTEM	-	-	-	-	SERVICE

◑ PIPE BETWEEN EQUIPMENT & 1ST CUT OUT VALVE IS TO BE TESTED IN SERVICE CONDITION.

* MINIMUM PRESSURE USED FOR DETERMINING PIPE THICKNESS IS 125 PSIG.
⊖ PIPES BETWEEN LAST CUT OUT VALVE & CONDENSER ARE TO BE TESTED WITH CONDENSER.

FLOW DATA TABLE

SYM	SIZE INCHES		FLOW #/HR	VEL FT/SEC	CONDITION	SERVICE
A	10"		23,960	88	ABS POWER	AUX EXHAUST TO D.F.T.
B	12"		30,490	544	PUMP RATING (ONE PUMP)	CARGO PUMP EXHAUST
C	16"		60,980	791	PUMP RATING (2 PUMPS)	CARGO PUMP EXHAUST TO MN COND
D	3"		5200 3570	155 106	ONE PLANT AT RATING	AUX EXH TO DISTL PLANT - CNDS COOLED UNIT ↓ ↓ ↓ ↓ ↓ S.W ↓ ↓
E	8"		20,400	91	ABS POWER	FEED PUMP EXHAUST
M	8"		10,500	136	↓	L.P. BLEED TO 2ND STAGE FEED HTR
N	8"		15,300	68	FIRE PUMP RATING	FIRE PUMP EXHAUST
F	24"		⊛ 18.800 Δ 20,210	⊛ 665 Δ 715	SSTG RATING	SSTG EXHAUST
G	8"		38,000	228	ASTERN	AUGMENTING FROM AUXILIARY STEAM
H	8"		15,000	276	IN-PORT MANUEVERING	AUX EXH UNLOADING TO CONDENSER
I	4"		3,560	81	ABS POWER	CROSSOVER BLEED TO AUX EXHAUST
J	8"		15,900	209	ABS POWER	L.P. BLEED TO 2ND STAGE FEED HEATER & DISTL PLANT
K	12"		15,990	182	ABS POWER	L.P. BLEED TO 1ST STAGE FEED HEATER
L	8"		5400 4450	74 61	ONE PLANT @ 16,000 GPD	↓ ↓ ↓ DISTL PLANT- CNDS COOLED UNIT ↓ ↓ ↓ ↓ ↓ SW ↓ ↓

⊛ H615C ONLY Δ HULL 613C & 614C

HULL NO. 613C, 614C, 615C	DWG NO. 6451-472	REV. H
		SHEET 12

K&E 191253 5-74 W 2847A•

MN 13-11X17 (REV. 1)

6451-472

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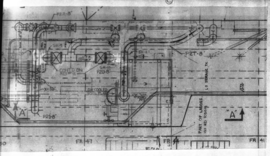
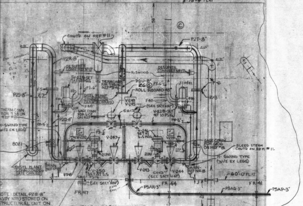
4X



PARTIAL PLAN 60'-0" FLAT

FWD

"X" DIM BELOW 78'-4" FLAT

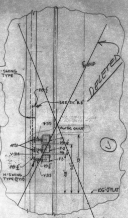


NOTE: DETAIL P2Q-8" (ASSY NO1) STORED ON STRUCTURAL UNIT ON PLATEN. FINAL FIT-UP AFTER UNIT ERECTED.

ELEV "A-A"

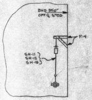
LKG TO STBD

FWD



SECTION "L-L"

LKG FWD



SECTION "N-N"

LKG FWD

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH'D	OWNER DATE	OWNER APP'D
A	-	INITIAL ISSUE	4/28/6	YHY	—	—
B	-	DESIGN DEVELOPMENT: ALTERED P1E-10" & P1F-10" TO CLEAR SOOT BLOWER FDN AT BHD 38. RBW	5/19/6	YHY	—	—
C	-	DESIGN DEVELOPMENT: ALTERED P2T-8" TO CLEAR CHOCK AT FR 44. ALTERED P3AB-6" & P3AC-6" TO CLEAR SHIPS STRUCTURE. ADDED PIPE Nº P3AW-6". RBW DESIGN DEVELOPMENT ADDED Y-STRAINER TO PIPE DETAIL P3AD-6" (ASSY Nº2) LAM REORIENTED V-233. ALT STBD FD PUMP EXH. RERAN P8-½" SEAL TO V-214	6/1/7	YHY	—	—
D	—	ADDED HANGERS. RERAN GLAND SEAL PIPING IN PLAN VIEW BELOW 33'-0" LVL	8/1/7	YHY	—	—
E	-	ELEV D-D", ADDED F-8 TO P1H-10". (WORK ACCOM. ON 613C.) PLAN VIEW BELOW 33'-0" AFT FR 41: P2AW-8" & P2AA-8 WAS P3AW-6 & P3AA-6". SECT E-E: ALT'D P3AC-6". PLAN BLW 33'-0" WL FWD FR 41: ALL 6" PIPE RUN ALT'D TO 8". ELEV D-D' ALT'D. (ALL TO SUIT DESIGN DEVELOPMENT.)	3/24/8	YHY	—	—
F	-	ADDED F-10 TO P1G-10" H613C & H614C ONLY MADE F-1 APPLICABLE TO H615C ONLY RERAN PIPING TO CONTROL PILOTS F1, F2, & F3 ADDED DRN TO V-228 & V-229	5/15/8	YHY	—	—
G	-	ALTERED JOINT NO. FOR 8" CONNECTION ON S.W. COOLED DISTILLING PLANT. PLAN BLW 33'-0" FLAT FWD FR 41 ALT'D P2AF-8, P2AG-8" & P2AH-8" LAM THE ABOVE HAS BEEN ACCOMPLISHED ON H613	11/13/8	YHY	—	—
H		ELEV. "A-A". ALTERED BLEED STEAM TO DIST. PLANT	11/6/8		—	—
J		PLAN 78'-4" FLAT & ABOVE; DELETED SENSING LINES TO F-2 & F-3. SKETCH B-B' ALT'D TO SUIT. (DELETED SECT "L-L") PLAN 33'-0"; RELOCATED F-2 & F-3 AND ASSOCIATED FITTINGS FROM 106'-0". SECT "E-E" ALT'D TO SUIT. WORK ACCOM. ON 613C BY LIAISON NO 613C-SAJ-95	2/28/9	YHY	—	—

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCES 1 AND 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REFERENCE 1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. AND REFERENCE 3.
4. BACKING RINGS AND COUPLINGS SHOWN IN LIST OF MAT'L ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMP AND ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REFERENCE 6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REFERENCE 1.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REFERENCE 4.
10. INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REFERENCE 5.
11. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
12. ALL PIPING ON THIS DRAWING IS CLASS II.
13. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS BUTT WELDS TYPE R-3, SOCKET WELDS TYPE R-14 & FLANGE WELDS TYPE P-16A ON REF #3 EXCEPT AS OTHERWISE INDICATED.
14. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
15. ALL HOLE CUTS ARE PROVIDED ON STRUCTURAL DWG'S.

FOR LIST OF MATERIAL, SEE DWG 6451-474

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS

ABS

USCG

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

COMMERCIAL SHIP DESIGN DEPT.

FSCM NO. 43689

NO.	REFERENCES	DWG NO.
20	↑ ↑ ↑ ↑ ↑ ↑	6450-685△
19	PIPING ARR - BOILER PRESSURE AUXILLIARY STEAM	6450-737⊛
18	PIPING ARR - L.P. STEAM DRAIN SYSTEM IN ENG. RM	6555-466
17	↑ ↑ MAIN ↑ ↑	6552-382
16	PIPING ARR - AUXILLIARY CONDENSATE SYSTEM	6552-410
15	↑ ↑ ↑ ↑ ↑ ↑	6451-491△
14	PIPING ARR - STRIPPING PUMP EXHAUST IN ENG RM	6451-488⊛
13	PIPING ARR - TURBO GENERATOR EXHAUST	6451-479
12	PIPING ARR - CARGO & BALLAST PUMP TURB EXH SYS-E.R.	6451-476
11	PIPING ARR - L.P. BLEED STEAM - ENGINE ROOM	6451-502
10	PIPING ARR - RELIEF VALVE ESCAPE IN ENG RM	6451-434⊛ 6451-464△
9	LIST OF THERMOMETERS FURNISHED BY SHIPYARD	6750-482
8	LIST OF PRESS & VAC GAGES FURNISHED BY SHIPYARD	6750-483
7	PIPING ARR - MISELLANEOUS INSTRUMENTS IN ENG. RM.	6755-67
6	PAINTING SCHEDULE	8300-40⊛ 41△
5	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
4	TYPICAL ARRANGEMENT OF GAGE PIPING	6750-481
3	FABRICATION & WELDING INSTRUCTIONS - CL I & II PIPING	257035
2	↑ ↑ ↑ ↑ ↑ ↑ ↑ ARR	6451-471
1	DIAGRAM - AUX EXH, L.P. BLEED ST, & R.V. ESC - LIST	6451-472

⊛ HULLS 613C & 614C
△ HULL 615C ONLY

SCALE ½ INCH = 1 FT
DRAWN ANTHONY STARKEY
CHECKED T.E. SEAMAN
SECT MGR J.B. Johnson
DATE COMPL 4-28-76
EXAMINED
AUTHORIZED
DATE
TECH APPROVAL 2/17/76
C S D APPROVAL R.L. Harrington

PIPING ARR - AUX EXHAUST STEAM SYSTEM - ENGINE ROOM PLAN, SECT, & ELEV

U S M A DESIGN TII-S-116a
U S M A DWG NO.
HULL NO.

DWG NO. 6451-473
REV J
SHEET NO. 1 OF 1

6451.473

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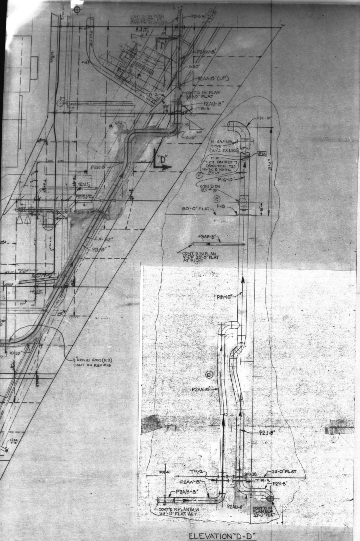
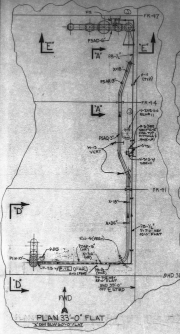
FRAME 1
10X



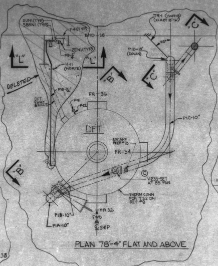
CONT'D IN PLAN 33'-0" FLAT
P2AW-8"
P2AA-8" (UP)
P2AU-8"
TR-3
"D"
P1F-10"
H-SWING TYPE (W/2 EX LEGS)
F-10 T-29 ON REF 7 (SKETCH 72)
P1G-10"
CONT'D ON REF #19
60'-0" FLAT
P5AP-3"
CONT'D IN PLAN VIEW 33'-0" FLAT AT RIGHT
P1H-10"
P2AA-8"
P2J-8"
FR 41
TR-2
BHD 38
33'-0" FLAT
P2AW-8"
TR-3
P2AB-8"
P2K-8"
P2AU-8"
CONT'D IN PLAN BLW 33'-0" FLAT AFT
CONT'D IN PLAN BLW 33'-0" FLAT
1/2" DRAIN BOSS (F-9) CONT ON REF #18

ELEVATION "D-D"
LKG TO STBD
FWD



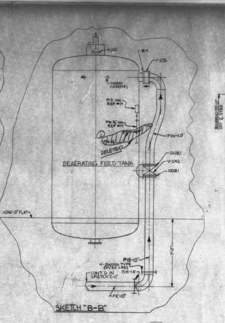
P2
FR 47
P3AD-6"
"E"
"A"
P8-1 1/2"
X-18"
H-11 (TYP)
P5AR-3"
FR 44
"A"
V-205 ON REF #11
P5AQ-3"
H-13 VERT
V-313 Y SBEN1
FR 41
"D"
X-18"
X-36"
P8-1 1/2"
RH-4 (VERT)
P1H-10"
F-23
P5AP-3"
BHD 38
BHD 39'-0" OFF ℄ STBD
"D"
FWD

PLAN 33'-0" FLAT
"X" DIM BLW 60'-0" FLAT



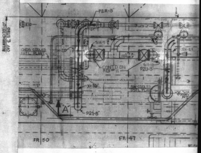
TR-1 (HORIZ)
"C"
BHD 38
P1D-10" (DOWN)
"L"
"L"
DELETED
"B"
"C"
P9-1/2"
H-11 (HORIZ)
FR 36
DFT
ESCAPE REF 10
FR 34
"B"
V-233 SET AT 85 PSIG
THERM CONN FOR T32 ON REF #9
P1B-10"
FR 32
FWD
℄ SHIP
P1A-10"
P1C-10"

PLAN 78'-4" FLAT AND ABOVE



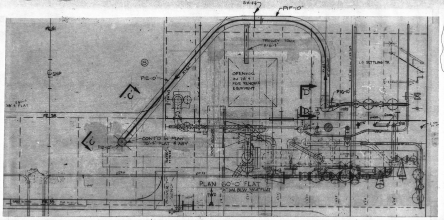
4021
Z-1
V-235
THERM CONN
DELETED
P1A-10"
DEAERATING FEED TANK
10021
V-242
10021
106'-0" FLAT
P1B-10"
H-SWING TYPE (W/EX LEGS)
CONT'D IN SKETCH "C-C"
SH-15
P1C-10"
7'-0"

SKETCH "B-B"



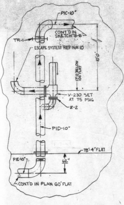
P2R-5"
"A"
P2S-5"
FR 50
FR 47

PARTIAL PLAN 60'-0" F
FWD
"X" DIM BELOW 78'-4" FLAT



SH-14
P1F-10"
FR 41
TROLLEY TRACK
℄ SHIP
P1E-10"
OPENING IN 78'-4" FOR REMOVAL EQUIPMENT
"D"
P1G-10"
L.O. SETTLING TK
78'-4" FLAT
FR 38
"C"
P1D-10"
CONT'D IN PLAN 78'-4" & ABV
FWD
FR 35

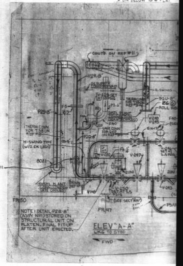
PLAN 60'-0" FLAT
"X" DIM BLW 78'-4" FLAT



P1C-10"
CONT'D IN SKETCH "B-B"
TR-1
ESCAPE SYSTEM REF NR 10
V-230 SET AT 75 PSIG
Z-2
P1D-10"
78'-4" FLAT
P1E-10"
CONT'D IN PLAN 60' FLAT

SKETCH "C-C"

BLEED STEAM CONT'D ON REF #11



CONT'D ON REF #11
P2R-8"
H-SWING
P2U-8"
P2S-5"
THERM CONN FOR T38 ON REF #9
H-SWING TYPE (W/2 EX LEGS)
8021
V-247
DISTL PLANT
FR 50
FR 47

NOTE: DETAIL P2R-8" (ASSY NR1) STORED ON STRUCTURAL UNIT ON PLATEN. FINAL FIT-UP AFTER UNIT ERECTED.

ELEV "A-A"
LKG TO STBD
FWD

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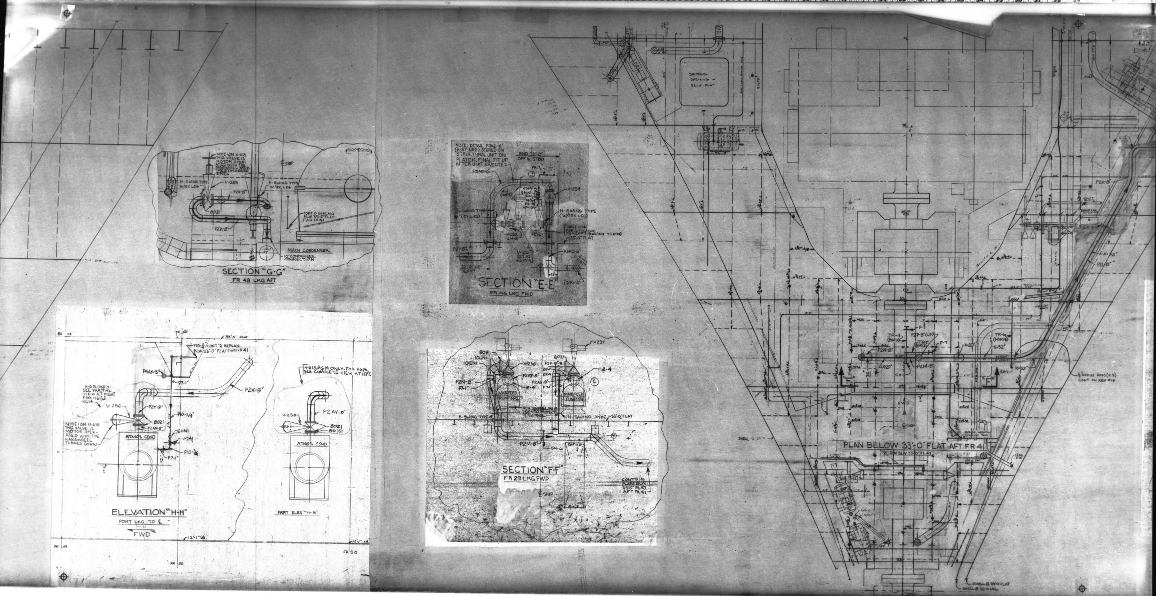
SEPT. '80
FRAME 2
10X


NOTE: ON H-615 THIS VALVE IS MOTOR OPERATED WITH THE HANDWHEEL OVER THE STARBOARD END.
H-SWING TYPE W/EX LEG
V-255
P2X-8"
H-SWING TYPE W/EX LEG
℄ SHIP
80Z1
P2Z-8"
CONT'D IN PLAN BLW 33'-0" FLAT FWD FR 41
MAIN CONDENSER
10" CONDENSER CONNECTION
SECTION "G-G"
FR 48 LKG AFT
NOTE: DETAIL P3AD-6" (ASSY No 2) STORED ON STRUCTURAL UNIT ON PLATEN. FINAL FIT-UP AFTER UNIT ERECTED
BHD 39'-0" OFF ℄ STBD
P3AD-6"
P8-1/2"
H-11 (HORIZ)
V51A
V-254
H-SWING TYPE (W/2 EX LEG)
H-SWING TYPE (W/2 EX LEG)
GAGE CONN FOR G103/G102
33'-0" FLAT
V-253
SH-5
V252
V-251 SET AT 63 PSIG
P2V-8"
32'-0" OFF ℄ SHIP
P3AC-6"
P2AX-8"
SECTION "E-E"
FR 46 LKG FWD
SHIPPING OPENINGS IN 33'-0" FLAT
FR 54
FR 50
33'-0" FLAT
P10-3/4" CONT'D IN PLAN BLW 33'-0" FLAT FWD FR 41
P4AK-5"
P7-1"
P2X-8"
H-615 ONLY. SEE PARTIAL VIEW AT RIGHT FOR H613 & H614
V-256
P2Y-8"
P10-3/4"
80Z1
P2AN-8"
NOTE: ON H-615 THIS VALVE IS MOTOR OPERATED WITH THE HANDWHEEL TURNED DOWN
GUN1
V-241
P10-3/4
P7-1"
ATMOS COND
ELEVATION "H-H"
PORT LKG TO ℄
FWD
12'-1" 1B.
H-613 & 614 ONLY. FOR H615, SEE COMPLETE VIEW AT LEFT.
P2AV-8"
V-256
80Z1
80JS1
ATMOS COND
PART ELEV "H-H"
FR 50
V237
80Z1
10UN1
10EN1
V-238
P2AT-8"
P2N-8"
P7-1"
Z-4
MAIN FEED PUMP No 2
80Z1
P2P-8"
P2AS-8"
P7-1"
Z-4
MAIN FEED PUMP No 1
RUN SENTINEL VALVE DISCH TO PROTECT PERSONNEL
H-SWING TYPE
H-SWING TYPE
33'-0" FLAT
P2M-8"
SH-6
SECTION "F-F"
FR 29 LKG FWD
℄ SHIP
CONT'D IN PLAN BLW 33'-0" FLAT AFT FR 41
F-7
TR-4 (HORIZ)
P2P-8" (UP)
TR5 (HORIZ)
F-7
X=20"
TR-6 (HORIZ)
X=52"
P2N-8"
X=20"
P2M-8"
SH-6
SH-7
X=52"
"F"
"F"
FWD
℄ SHIP
PLAN BELOW 33'-0" FLAT AFT FR 41
"X" DIM BLW 33'-0" FLAT
P2K-8"
P2L-8"
SHELL @ 33'-0" FLAT

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MICRO-MASTER® 105 mm

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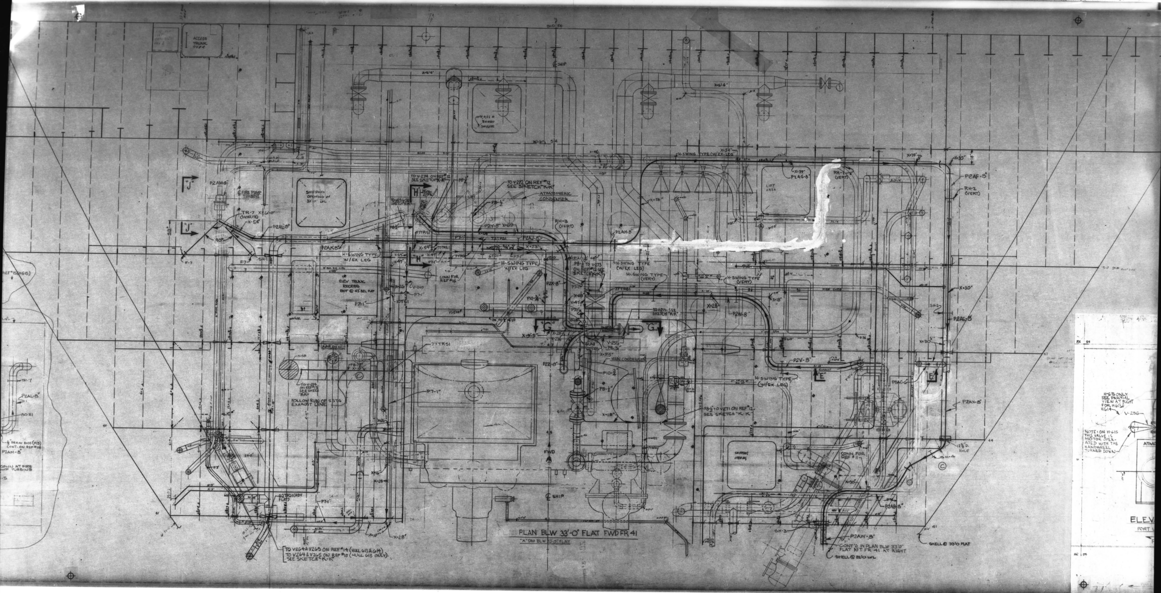
SEPT. '80

FRAME 3

10X


ACCESS TRUNK
℄ SHIP
X-6'-6"
SHIP PIPES OPENING IN 33' WL
FIRE PUMP TURBINE
P2AM-8"
"J"
TR-7
X-54"
P2AL-8"
P2AK-8"
H-SWING TYPE W/EX LEG
TO V-274 ON REF #12 SEE SKETCH "K-K"
TO V-272 ON REF #12 SEE SKETCH "K-K"
ATMOSPHERIC CONDENSER
"H"
RH-3 (VERT)
P2AH-8"
H-SWING TYPE (W/EX LEG)
X-54"
X-39"
P2AG-8"
LIFT AREA
RH-1 (VERT)
RH-2 (VERT)
P2AF-8"
X-30"
H-SWING TYPE (VERT)
ELEV TRUNK RECESS BOT @ 45 ABL FLAT
CONN FOR REF #15
TO V-273 ON REF #12 SEE SKETCH "K-K"
P2W-8"
TO V-255 SEE SKETCH "K-K"
"G"
P2AE-8"
SH-2
MAIN CONDENSER
P2V-8"
"E"
P2AC-8"
P2AX-8"
TO V-214 ON REF #15 SEE SKETCH "K-K"
FOLLOW RUN OF S.S.T.G. EXHAUST LINE
P7-1"
P8-½" TO V-271 ON REF #12 SEE SKETCH "K-K"
FWD
SHIPPING OPENING
CONN FOR REF #11
SH-4
12½" Ø HOLE
℄ SHIP
P2AB-8"
SH-3
P2AW-8"
CONT'D IN PLAN BLW 33'-0" FLAT AFT FR 41 AT RIGHT
SHELL @ 32'-0 WL
SHELL @ 33'-0 FLAT
TO V264 & V265 ON REF #14 (HULL 613 & 614)
TO V264 & V265 ON REF #15 (HULL 615 ONLY)
SEE SKETCH "K-K"
CONN AT FIRE PUMP TURBINE
H-615 ONLY SEE PARTIAL VIEW AT RIGHT FOR H613 & H614
V-256
NOTE: ON H-615 THIS VALVE IS MOTOR OPERATED WITH THE HANDWHEEL TURNED DOWN
ELEV
PORT

PLAN BLW 33'-0" FLAT FWD FR 41

"X" DIM BLW 33'-0" FLAT

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MICRO-MASTER 105 mm

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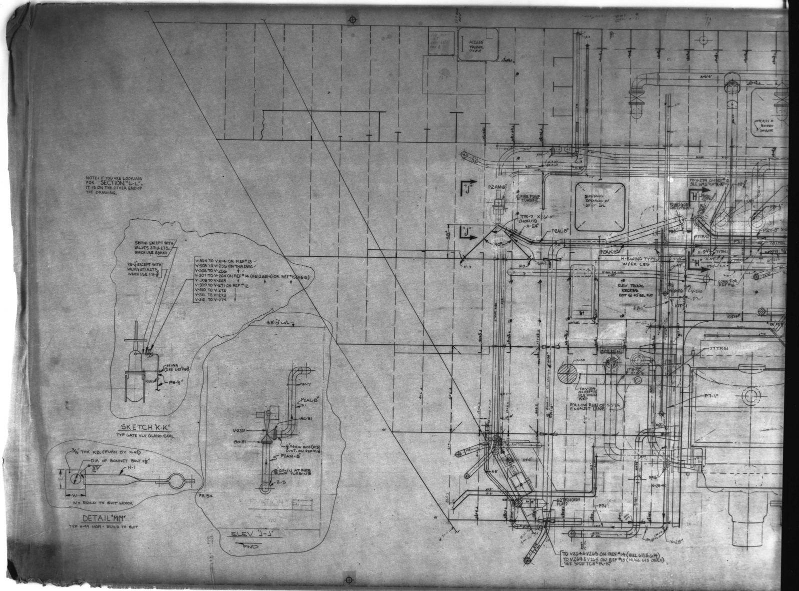
SEPT. '80

FRAME 4

10X


NOTE: IF YOU ARE LOOKING FOR SECTION "L-L", IT IS ON THE OTHER END OF THE DRAWING.
5BRNI EXCEPT WITH VALVES 271 & 273, WHICH USE 6BRNI
P9-½" EXCEPT WITH VALVES 271 & 273, WHICH USE P11-
V-304 TO V-214 ON REF #13
V-305 TO V-255 ON THIS DWG
V-306 TO V-256
V-307 TO V-264 ON REF #14 (H613 & 614) OR REF #15 (H615)
V-308 TO V-265
V-309 TO V-271 ON REF #12
V-310 TO V-272
V-311 TO V-273
V-312 TO V-274
H-99 (SEE DET MM)
4(UN)
P8-½"
SKETCH "K-K"
TYP GATE VLV GLAND SEAL
3/16" THK F.B. (FURN BY X-42)
DIA OF BONNET BOLT + 1/8"
3/16
H-1
W
W = BUILD TO SUIT WORK
DETAIL "MM"
TYP H-99 HGR - BUILD TO SUIT
FR 54
33'-0" LVL
TR-7
P2AL-8"
80 Z1
V-239
80 Z1
½" DRAIN BOSS (R3) CONT. ON REF #18
P2AM-8"
8" CONN AT FIRE PUMP TURBINE
Z-5
ELEV "J-J"
FWD
ACCESS TRUNK OVER
"J"
P2AM-8"
℄ FIRE PUMP TURBINE
SHIPPING OPENING IN 33'-0" LVL
TR-7 X=6'-0" (HORIZ)
X-54"
P2AL-8"
38"
"J"
90°
F-7
F-7
SH-1
P2AK-8"
H-SWING TYPE W/EX LEG
ELEV TRUNK RECESS BOT @ 43' BEL FLAT
TO V-274 ON REF #12 SEE SKETCH "K-K"
TO V-256-58 SKETCH "K-K"
"H"
P8-½"
P8-½"
P2Y-5"
77TRS1
X=54"
77TRS1
P7-1"
73TRS1
6TS1
X-54"
X-47"
"H"
P7-1"
CONN FOR REF #16
X-26"
V-240
P7-1"
10TS1
P7-1"
77TRS1
X-58
P8-½" X-10½"
TO V-274 ON REF #13 SEE SKETCH "K-K"
FOLLOW RUN OF SSTG EXHAUST LINE
P7-1"
24'-0"
X-9"
X-9"
X-9"
62TRS1 (ABV FLAT)
P7-1"
X-16"
X-28"
X-10"
X-28"
TO V264 & V265 ON REF #14 (HULL 613 & 614)
TO V264 & V265 ON REF #15 (HULL 615 ONLY)
SEE SKETCH "K-K"

6451.423

MICRO-MASTER® 105 mm
K+E
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ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 5
10X

6451-474

CSD.Vault

X 163

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 2-28-9
SIGNED

YARD PRINTS | ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS																										
REV.	J	J	E	J	F	C	H	G	J	J	J	H	F	H	H	A	C	A	C	A	J	J	H	J	H	F
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	10A	11A	12A	21	22	23

GROUP
MC NO.

PARTIAL ISSUE
SHEETS 1, 2, 4, 9, 10, 10A, 11, 11A & 21 ONLY

NNS&DD Co. HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C	311		
614C	310		
613C	309	T11-S-116a	

DWG. REV. — HULL APPLIC.

REV.	613	614	615
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	YES
E	YES	YES	YES
F	YES	YES	NO
G	YES	YES	YES
H	YES	YES	YES
J	YES	YES	YES

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP DESIGN DEPT.

INSTALLATION GROUP : 6451-0104-2204PI, 6451-0113-1109PI
6451-0104-2105PI, 6451-0117-1110PI
6451-0105-1106PI, 6451-0117-1111SI
6451-0104-2107SI, 6451-0113-1112SI
6451-0106-1108PI

ARR DWG 6451-473
PIPE DET 6451-475

SCALE NONE =1 Ft.
DRAWN ANTHONY STARKEY
CHECKED T.E. SEAMAN
SECT. MGR. J.K. Johnson
DATE COMPL. 4-28-76
EXAMINED —
AUTHORIZED E.E. Stephenson
DATE 4-28-76
TECH. APPROVAL NR
CSD APPROVAL R. L. Harrington

GROUPED BY / CHK. — DATES COMP. / PART — HULL 613C GROUP NO. / KEY
TYPE OF DWG. —

TITLE PIPING ARR-AUX EXHAUST STEAM SYSTEM-ENGINE ROOM-LIST OF MATERIAL 981

DWG. NO. 6451-474 REV J SHEET NO. 1 OF 23

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE RJP	4/28/6		—	—
B	11	LINE 6 ADDED P3AW-6' RBW/TES	6/1/7		-	-
C	4 6 7 10A 11A 12A 14 15 17 19	ADDED LINES 13-17 ADDED LINE 12 ADDED LINES 15-17 ADDED ↓ ADDED LINES 13-18 ADDED LINES 8, 13-15 ALTERED LINES 5,6,13,14,15 ADDED LINES 10-15	8/1/7	AC JHJ*	–	–
	10A	ADDED LINE 11. (WORK ACCOMP. ON 613C.)				
D	9 10A 11 11A 14 15	LINE 4 WAS 6", QTY LINE 12 WAS 2. QTY LINE 6 WAS 1, DELETED LINE 7. LINES 3&6 WERE 6", QTY LINE 8 WAS 1. ALT'D LINES 4,6&7. LINES 3-6 WERE 5", QTY LINES 9&14 WAS 2&1 RESP. DELETED L'S 10&15. ADDED L.7. ALT LINES 16-18 LINES 1-3 WERE 5", ALT'D LINES 7,13&14, DELETED LINES 10&15. ADDED LINES 11&16. WAG	3/21/8	JHJ*	—	—
E	7	ADDED LINE 12 (H613C & H614C)				
	3 4	MADE LINE 15 APPLICABLE TO H615C ONLY ↓ 7 ↓			—	–
	3	ADDED LINES 16, 17, & 18 INCREASED QTY LINE 5; WAS 20'-0"	5/15/8	AC JHJ*		
F	13	DELETED LINE 4. ADDED LINE 5. ERS			–	–
	3	DELETED LINES 1,2,3,6,9,11,12,13,14. QTY LINE 5 WAS 40'-0"				
	4	DELETED LINES 13,15,17 QTY LINES 1,3,4,5,6 WAS 3				
	5	DELETED LINES 1 THRU 6				
	21,22,23	ADDED	7/14/8	AC		
		NOTE: WORK ALREADY ACCOMPLISHED ON 613C		JHJ		
G	8	DECREASED QTY LINES 4,5,&6 WAS 16,16,&2. ADDED LINES 7,8,&9. ERS	9/14/8		—	—
		WORK ACCOMPLISHED ON 613C		JHJ		
H	12 15 7 10A	LINE 18 ADDED LINE 18 ADDED LINES 18 & 19 ADDED HANGER LOADS ADDED (WORK ACCOMPLISHED ON H613C)	11/2/8	JHJ	—	—
J	4 9 10 11 11A 21 10A	DELETED L'S 8, 9 & 10 QTY OF L'S 8,9,15 & 16 WAS 10", 9'-0" 2 & 2 RESPECT. ADDED L'S 17 & 18, 10 & 11 ADDED L. 13 & L17 ADDED L'S 7,10,16 & 17. ADDED L'S 10 THRU 15. DELETED L'S 10, 11 & 14 THRU 18 ADDED L'S 13, 14	2/28/9	K JHJ		
		ABOVE WORK ACCOMP ON 613C BY LIAISON 613C-JHJ-35				

NOTE: FOR ADDITIONAL INFORMATION ON MAT'L, SEE REF 1

NO.	REFERENCES	DWG. NO.
1	DIAGRAM-AUX EXH, BLEED ST, & RELIEF VLV ESCAPE-LIST	6451-472

HULL NO. 613C, 614C, & 615C DWG. NO. 6451-474
REV. J SHEET 2 OF —

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
F		~~1~~	~~1~~	~~P1A~~	~~10"IPS X STD THK PIPE STL~~	~~PIPE DETAIL~~ 6451-475	PS	
F		~~2~~	~~1~~	~~P1B~~	↓	↓	↓	
F		~~3~~	~~1~~	~~P1C~~	↓	↓	↓	
		4	1	P1D	↓	↓	↓	
F		5	200'	P8	½"IPS X"X" HVY THK	K57-07-102		
F		~~6~~	~~36"~~	~~P9~~	~~¼"IPS~~ ↓ ↓	~~K57-07-100~~	↓	
		7						
		8						
F		~~9~~	~~1~~	~~V233~~	~~4"ANGLE RELIEF 150# FLG STL~~ (SET AT 85 PSIG)	PO (1-D) 6400-T2	MD-PS	
		10	1	V230	6"X8" ANGLE RELIEF 150# FLG STL (SET AT 75 PSIG)	PO ⑭ 6450-C7		
F		~~11~~	~~1~~	~~V235~~	~~10" WAFER CHECK STL~~	PO ⑤ 6200-M5		
F		~~12~~	~~1~~	~~V-242~~	~~10" GATE 150# FLG STL~~	PO ㉑ 6451-M3		
F		~~13~~	~~1~~	~~V313~~	~~½" GLOBE 250# SCRD BRONZE~~	PO ③ 6450-C27		
F		~~14~~	~~1~~	~~V314~~	~~½"~~ ↓ ↓ ↓	③		
E		15	1	V315⊗	½" ↓ ↓ ↓	↓ ③	↓	
E		16	2	F-20	½" UNION MI SCRD 300#	S 25-12-164	ST-PS	
E		17	1	F-21	½" SCRD PIPE CAP GALV	S 25-06-174		
E		18	1	F-22	½" IPS X"X" HVY STL NIPPLE L=3"	S 25-14-853E	↓	

REMARKS - ⊗ H615C ONLY

SERVICE - AUXILLIARY EXHAUST
GROUP NO. PS-177 6451-0117-1111SI SHT 1 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-474 SHEET 3 REV. F

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
F		1	2	100WS1	10" BACKING RING STL (STD)	25-20-962	ST-PS	
		2	1	4UN1	½" UNION 300# M.I. SCRD	25-12-164		
F		3	1	2UN1	¼" ↓ ↓ ↓ ↓	25-12-160		
F		4	2	4TS1	½" TEE SW 3000# STL	PO ⑩ 6200-M12	MD-PS	
F		5	1	5BRN1	½"x¼" BUSHING 150# M.I. SCRD	25-05-324	ST-PS	
F		6	1	2EN1	¼" ELL 150# MI SCRD	25-09-190		
E		7	1	F-1⊗	PILOT FOR V-119	PO (10A) 6450-C10	MD-PS	
J		~~8~~	~~1~~	~~F2~~	~~PILOT FOR V-251~~	(11A)		
J		~~9~~	~~1~~	~~F3~~	~~PILOT FOR V-205~~	(12A) ↓		
J		~~10~~	~~3~~	~~F4~~	~~3"x3"x¼" ANGLE STL L=12"~~	~~73-06-238~~	PS	
		11						
C		12		HGR NO				
F		~~13~~	~~1~~	~~SH-16~~	~~10" SPRING HGR~~	~~PO (114)~~ 6552-C16	MD-PS	
C		14	1	TR-1	10" TIE ROD HGR	MD 283176 SH 35 L1	BIO-PS	
F		~~15~~	~~1~~	~~H-11~~	~~½" SWING HGR~~	S ~~25-46-326~~		
C		16	4	H-12	½" ↓ ↓	S 25-47-326		
F		~~17~~	~~1~~	~~H-14~~	~~10"~~ ↓ ↓ (W/EX LEG)	S 25-49-466	↓	
		18						

REMARKS - ⊗ H615C ONLY

SERVICE - AUXILLIARY EXHAUST
GROUP NO. PS-177 6451-0117-1111SI SHT 2 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-474 SHEET 4 REV. J

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
F	~~1~~	~~12~~			~~BOLTS~~	~~⅞" HVY HEX HEAD L=9¾"~~	~~6000-C7~~ (64)	MD-PS	
F	~~2~~	~~12~~	~~Z1~~	~~10"~~	~~NUTS~~	~~⅞" HVY HEX~~	~~6000-C11~~ ④		
F	~~3~~	~~2~~			~~GSKT~~	~~1/16" COMPRESSED ASBESTOS 150#~~	~~15-01-286E~~	ST-PS	
F	~~4~~	~~24~~			~~BOLTS~~	~~⅞" HVY HEX HEAD L=3¾"~~	~~6000-C7~~ ⑮	MD-PS	
F	~~5~~	~~24~~	~~100Z1~~	~~10"~~	~~NUTS~~	~~⅞" HVY HEX~~	~~6000-C11~~ ④		
F	~~6~~	~~2~~			~~GSKT~~	~~1/16" COMPRESSED ASBESTOS 150#~~	~~15-01-286E~~	ST-PS	
	7	8			BOLTS	⅝" HVY HEX HEAD L=3"	6000-C7 ㉕	MD-PS	
	8	8	40Z1	4"	NUTS	⅝" HVY HEX	6000-C11 ②		
	9	1			GSKT	1/16" COMPRESSED ASBESTOS 150#	15-01-278E	ST-PS	
	10	8			BOLTS	¾" HVY HEX HEAD L=4"	6000-C7 (52)	MD-PS	
	11	8	Z-2	6"	NUTS	¾" HVY HEX	6000-C11 ③		
	12	1			GSKT	1/16" COMPRESSED ASBESTOS 150#	15-01-282E	ST-PS	
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17		○		NUTS				
	18				GSKT				
	19				BOLTS				
	20		○		NUTS				
	21				GSKT				
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

REMARKS -

SERVICE - AUXILLIARY EXHAUST
GROUP NO. PS-177 6451-0117-1111SI SHT 3 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-474 SHEET 5 REV. F

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1E	10"IPS X STD THK PIPE STL	PIPE DETAIL 6451-475	PS	
		2	1	P1F	↓ ↓ ↓	↓	↓	
		3						
		4						
		5	1	100WS1	10" BACKING RING STL (STD)	25-20-962	ST-PS	
		6						
		7						
		8						
		9						
		10						
C		11		HGR NO				
C		12	1	SH-14	SET AT 910# HOT 10" SPRING HGR MOVE COLD TO HOT .29" UP	PO (113) 6552-C16	MD-PS	
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - AUXILLIARY EXHAUST
GROUP NO. PS-155 6451-0117-1110PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-474 SHEET 6 REV. C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1G	10"IPS X STD THK PIPE STL	PIPE DETAIL 6451-475	PS	
		2	1	P2R	8"IPS			
		3	1	P2S	↓			
		4	1	P2T				
		5	1	P2U	↓ ↓ ↓	↓	↓	
		6						
		7						
		8	2	100WS1	10" BACKING RING STL (STD)	25-20-962	ST-PS	
		9	2	80WS1	8" ↓ ↓	97-18-137	↓	
		10	1	F-5	8" ORIFICE CNDS COOLED DSTL PLANT	PART OF 6401-C1 ①	MD-PS	
		11	1	F-6	8" ↓ S.W. ↓ ↓ ↓	↓ ②	↓	
E		12	1	F-10 Δ	¾" BOSS STL SW	S 25-02-224	ST-PS	
		13						
C		14		HGR NO				
C		15	1	SH-9	8" SPRING HGR SET AT 914# HOT. COLD TO HOT .40" UP	PO (108) 6552-C16	MD-PS	
C		16	1	SH-10	8" ↓ SET AT 1691# HOT COLD TO HOT .31" UP	↓ (109)		
C		17	1	H-12	10" SWING HGR (W/2 EX LEGS)	S 25-47466	BIO-PS	
H		18	*1	SH-20	*SPRING HANGER SET AT 800# HOT COLD TO HOT .31" UP	PO * 6552-C16 (82)	ST-PS	
H		19	*1	SH-21	* ↓ COLD TO HOT .40" UP	* ↓ (113)	↓	

REMARKS - Δ H613C & H614C ONLY
*{H614C ONLY (X42 MODIFY AS NECESSARY) MATL. FURN ON LIAISON 613C-JHJ-23 FOR H613C.
{USE H615 MATL.

SERVICE - AUXILLIARY EXHAUST
GROUP NO. PS-166 6451-0113-1112SI SHT 1 OF 2
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-474 SHEET 7 REV. H

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	16			BOLTS	¾" HVY HEX HEAD L=4"	6000-C7 (52)	MD-PS	
	2	16	Z-3	8"	NUTS	¾" HVY HEX	6000-C11 ③		
	3	4			GSKT	1/16" COMPRESSED ASBESTOS 150#	15-01-284E	ST-PS	
G	4	8			BOLTS	¾" HVY HEX HEAD L=3½"	6000-C7 ⑳	MD-PS	
G	5	8	80Z1	8"	NUTS	¾" HVY HEX	6000-C11 ③		
G	6	1			GSKT	1/16" COMPRESSED ASBESTOS 150#	15-01-284E	ST-PS	
G	7	8			STUDS	¾"-10UNC-2A STL L=3½"	S/21-18-560	↓	
G	8	8	Z6	8"	NUTS	¾" HVY HEX	6000-C11 ③		
G	9	1			GSKT	1/16" COMPRESSED ASBESTOS	15-01-284E	↓	
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20		○		NUTS				
	21				GSKT				
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

REMARKS -

SERVICE - AUXILLIARY EXHAUST
GROUP NO. PS-166 6451-0113-1112SI SHT 2 OF 2
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-474 SHEET 8 REV. G

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1H	10"IPS X STD THK PIPE STL	PIPE DETAIL 6451-475	PS	
		2	1	P2J	8"IPS			
	ASSY	3	1	P2Q	↓			
D		4	1	P2AA	8"IPS			
		5	1	P5AP	3"IPS			
		6	1	P5AQ				
		7	1	P5AR	↓ ↓	↓		
J		8	10' 31'-0"	P8	½"IPS X"X" HVY THK	K57-07-102		
J		9	9½' 13'-0"	P9	¼"IPS ↓ ↓	K57-07-100		
J		10	1	F-3	PILOT FOR V-205	PO (12A) 6450-C10		
J		11	1	V313	½" GLOBE V. 250# SCRD BRONZE	PO ③ 6450-C27	↓	
D		12	2 3	80WS1	8" BACKING RING STL (STD)	97-18-137	ST-PS	
		13	2	60WS1	6"	25-20-946		
		14	4	30WS1	3" ↓ ↓ ↓	97-18-126		
J		15	2 3	5BRN1	½"x¼" RED BUSHING 150# M.I. SCRD	25-05-324		
J		16	2 3	2UN1	¼" UNION 300# M.I. SCRD	25-12-160		
J		17	4	4CS1	½ COUPLING STL SW 3000#	S/ 25-60-052		
J		18	4	H-11	½" SWING TYPE HGR	S/ 25-46-326	↓	

REMARKS -

SERVICE - AUXILLIARY EXHAUST
GROUP NO. PS-152 6451-0113-1109PI SHT 1 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-474 SHEET 9 REV. J

6451-474

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
Registered trade-mark of KEUFFEL & ESSER CO.
SEPT. '80
FRAME
8X

6451-474

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

8X

FRAME

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	ASSY #1	1	1	V228	4"X6" ANGLE RELIEF 250#X125# FLG CAST IRON (SET AT 10 PSIG)	ON PIPE DETAIL 6451-475	PS	
		2	1	V229	↓	↓	↓	
		3	1	V243	3" GATE 150# FLG STL	↓	↓	
		4	1	V244	↓	↓	↓	
		5	1	V245	3" GLOBE STOP 150# FLG STL	↓	↓	
		6	1	V246	3" PRESS RED 150# FLG STL (SET AT 5.5 PSIG)	↓	↓	
		7	1	V247	3" GATE 150# FLG STL	↓	↓	
		8	1	V248	↓	↓	↓	
		9	1	V249	3" GLOBE STOP 150# FLG STL	↓	↓	
		10	1	V250	3" PRESS RED 150# FLG STL (SET AT 5,5 PSIG)	↓	↓	
		11	1	V279	1/2" GLOBE STOP 250# BRONZE SCRD	↓	↓	
		12	1	V280	↓	↓	↓	
J		13	1	F-4	3x3x1/4" ANGLE STL L=12"	73-05-238		
		14	2	J20	6" SLIP-ON FLANGE STL. F.F.	S 25-18-577	ST-PS	
		15	2	F40	6" 90° ELL STL SCH. 40 L.R.	PO ⑥ 6450-C25	MD-PS	
		16	7 FT	P3	6" SCH.40 STL PIPE	S 57-06-114	PS	
J		17	1	4TS1	1/2 TEE SW 3000# STL	PO ⑩ 6200-M12	ST-PS	
		18	16 16 2	Z2	3/4" BOLT 4" LONG 3/4" NUT 6" 150# GASKET	PO 6000-C7 (52) PO 6000-C11 ③ S 15-01-282	MD-PS ↓ ST-PS	

REMARKS -

SERVICE - AUXILLIARY EXHAUST

PS-152

APPLICABLE HULLS	613C	614C	615C	GROUP NO.	6451-0113-1109 PI SHT 2 OF 3	DWG NO. 6451-474	SHEET 10	REV. J

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	HGR Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	SH-11	HOT LOAD 282#. MOVE COLD TO HOT .06 DOWN 3" SPRING HGR	PO (110) 6552-C16	MD-PS	
		2	1	SH-12	3" ↓ HOT LOAD 518# MOVE COLD TO HOT .03" UP	↓ (111)	↓	
		3	1	SH-13	3" ↓ HOT LOAD 282# MOVE COLD TO HOT .06 DOWN	↓ (112)	↓	
		4	2	H-13	3" SWING HGR	S 25-48-396	B10-PS	
		5	1	R-H-4	3" ROD HGR	MO 283176 SH 38 L 7	↓	
D		6	3	H-12	8" SWING HGR	S 25-47-446	↓	
D		7	~~2~~	~~H-12~~	~~5"~~ ↓ ↓	~~S 25-47-426~~	↓	
		8						
		9		FTG Nº				
		10	4'-0"	F-4	3"X3"X1/4" ANGLE STL	73-05-238	PS	
D		11	1	F-8	10" INSULATED DK CONN	MO 216686 S.4 L.1	ST-PS	
		12						
J		13	1	V315	1/2" GLOBE V - 250# SCRD BRONZE	PO ③ 6450 C-27	ST-PS	
J		14	1	2EN1	1/4" 90° ELL 150# MI SCRD	S/ 25-09-190	↓	
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - AUXILLIARY EXHAUST

APPLICABLE HULLS	613C	614C	615C	GROUP NO.	6451-0113-1109 PI SH 3 OF 3	DWG NO. 6451-474	SHEET 10A	REV. J

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2K	8" IPS X STD THK PIPE STL	PIPE DETAIL 6451-475	PS	
		2	1	P2AU	↓	↓	↓	
D		3	1	P2AB	8" IPS	↓	↓	
		4	1	P3AC	6" IPS	↓	↓	
	ASSY #2	5	1	P3AD	↓	↓	↓	
D		6	1	P2AW	8"	↓	↓	
J		7	16'-0"	P8	1/2" IPS X "X-HVY" THK PIPE STL	S/ 57-07-102		
D		8	3	80WS1	8" BACKING RING STL (STD)	97-18-137	ST-PS	
		9	2	60WS1	6" ↓	25-20-946	↓	
J		10	48"	P9	1/4" IPS X "X-HVY" THK PIPE STL	S/ 57-07-100		
		11						
	ASSY #2	12	1	V-251	3" EXH DUMP 150# FLG STL	ON PIPE DETAIL 6451-475	PS	
		13	1	V-252	3" GATE 150# FLG STL	↓	↓	
		14	1	V-253	↓	↓	↓	
		15	1	V-254	6" GLOBE STOP	↓	↓	
J		16	1	V-314	1/2 GLOBE V.-250# SCR'D BRONZE	PO ③ 6450-C27	ST-PS	
J		17	2	H-11	1/2 SWING TYPE HGR	S/ 25-46-326	↓	
		18						

REMARKS -

SERVICE - AUXILLIARY EXHAUST

PS-152

APPLICABLE HULLS	613C	614C	615C	GROUP NO.	6451-0105-1106 PI SHT 1 OF 2	DWG NO. 6451-474	SHEET 11	REV. J

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	HGR Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	H-11	6" SWING HGR	S 25-46-436	B10-PS	
		2	1	H-12	3" ↓ (W/2 EX LEG)	S 25-47-396	↓	
		3	1	H-12	8" ↓ ↓	S 25-47-446	↓	
D		4	1	TR-2 *	6" TIE ROD HGR	MO 283176 SH 35 L7	↓	
		5	1	TR-3	8" ↓ ↓	MO 283176 SH 35 L 13	↓	
D		6	1	SH-3	HOT LOAD 752# 6" SPRING HGR MOVE COLD TO HOT 1.02" DN.	PO ③ 6450-C62	MD-PS	
D		7	1	SH-4	6" ↓ HOT LOAD 694# MOVE COLD TO HOT .55" DN.	↓ ④	↓	
		8	1	SH-5	3" ↓ HOT LOAD 153# MOVE COLD TO HOT .03" DN.	PO (104) 6552-C16	↓	
		9						
J		10	1	5BRN1	1/2"x1/4" BUSHING MI SCREWED	S/ 25-05-324		
J		11	1	2UN1	1/4" UNION - 300# MI SCREWED	S/ 25-12-160		
J		12	1	F-2	PILOT FOR V-251	PO (11A) 6450-C10		
J		13	1	4CS1	1/2" COUPLING STL SW 3000#	S/ 25-60-052		
J		14	1	2EN1	1/4" 90° ELL 150# MI-SCREWED	S/ 25-09-190		
J		15	1	F-4	3x3x1/4" L STL L=12"	73-05-238		
		16						
		17						
		18						

REMARKS -

* X-42 TO REPLACE 6" PIPE WITH 8" PIPE CLAMP (S/25-43-446)

SERVICE - AUXILLIARY EXHAUST

APPLICABLE HULLS	613C	614C	615C	GROUP NO.	6451-0105-1106 PI SH 2 OF 2	DWG NO. 6451-474	SHEET 11A	REV. J

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2L	8" IPS X STD THK PIPE STL	PIPE DETAIL 6451-475	PS	
		2	1	P2M	↓	↓	↓	
		3	1	P2N	↓	↓	↓	
		4	1	P2P	↓	↓	↓	
		5	1	P2AS	↓	↓	↓	
		6	1	P2AT	↓	↓	↓	
		7	12'-0"	P7	1" IPS ↓ ↓	K57-06-104	↓	
		8						
		9						
		10	1	V-237	8" BACK PRESS & REL 150# FLG STL (MOTOR OPERATED)	ON PIPE DETAIL 6451-475	PS	
		11	1	V-238	↓	↓	↓	
		12						
		13						
		14	4	80WS1	8" BACKING RING STL (STD)	97-18-137	ST-PS	
		15	2	10UN1	1" UNION 300# M.I. SCRD	25-12-168	↓	
		16	2	10EN1	1" ELL 90° 150# M.I. SCRD	25-09-198	↓	
		17						
H		18	1	F9	1/2" BOSS STL. S.W. (COUPLET)	PO ② 6454-C8	ST-PS	

REMARKS -

SERVICE - AUXILLIARY EXHAUST

PS-148

APPLICABLE HULLS	613C	614C	615C	GROUP NO.	6451-0106-1108 PI SHT 1 OF 3	DWG NO. 6451-474	SHEET 12	REV. H

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	HGR Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	SH-6	HOT LOAD 2081# 8" SPRING HGR MOVE COLD TO HOT .05" DN.	PO (105) 6552-C16	MD-PS	
		2	1	SH-7	8" ↓ HOT LOAD 213# MOVE COLD TO HOT .26" DN	↓ (106)	↓	
		3	1	SH-8	8" ↓ HOT LOAD 1024# MOVE COLD TO HOT .92" DN	↓ (107)	↓	
		4	1	TR-4	8" TIE ROD HGR	MO 283176 SH 36 L1	B10-PS	
		5	1	TR-5	8" ↓ ↓	MO 283176 SH 36 L6	↓	
		6	1	TR-6	8" ↓ ↓	MO 283176 SH 36 L11	↓	
		7	2	H-12	1" SWING TYPE HGR	S 25-47-346	↓	
		8						
		9		FTG Nº				
		10	6'-0"	F-7	4"X2.66"X7.7# I-BEAM STL	S 73-08-204	X10-PS	
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - AUXILLIARY EXHAUST

APPLICABLE HULLS	613C	614C	615C	GROUP NO.	6451-0106-1108 PI SH 2 OF 3	DWG NO. 6451-474	SHEET 12A	REV. H

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	16	8021	8"	BOLTS	3/4" HVY HEX HEAD L=4"	6000-C7 (52)	MD-PS	
	2	16			NUTS	3/4" HVY HEX	6000-C11 ③	↓	
	3	2			GSKT	1/16" COMPRESSED ASBESTOS 150#	15-01-284E	ST-PS	
F	4	—	Z-4	8"	BOLTS	—	—		
F	5	16			NUTS	3/4" HVY HEX	6000-C13 (39)		
	6	2			GSKT	1/16" COMPRESSED ASBESTOS 150#	15-01-284E	ST-PS	
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

REMARKS -

SERVICE - AUXILLIARY EXHAUST

PS-148

APPLICABLE HULLS	613C	614C	615C	GROUP NO.	6451-0106-1108 PI SHT 3 OF 3	DWG NO. 6451-474	SHEET 13	REV. F

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2V	8" IPS X STD THK PIPE STL	PIPE DETAIL 6451-475	PS	
		2	1	P2W	↓	↓	↓	
D		3	1	P2AE	↓	↓	↓	
↓		4	1	P2AF	↓	↓	↓	
↓		5	1	P2AG	↓	↓	↓	
↓		6	1	P2AH	↓	↓	↓	
↓		7		P2AX	↓	↓	↓	
		8						
D		9	6	80WS1	8" BACKING RING STL (STD)	97-18-137	ST-PS	
D		10	~~4~~	~~50WS1~~	~~5"~~ ↓ ↓	~~25-20-940~~	~~ST-PS~~	
		11						
	C	12		HGR Nº				
	C	13		H-14	8" SWING TYPE HGR	S 25-49-446	B10-PS	
	D	14	3	H-14	8" ↓ ↓ (W/EX LEG)	↓	↓	
	D	15	~~2~~	~~H-14~~	~~5"~~ ↓ ↓ ↓	~~S~~ 25-49-426	↓	
	D	16	1	RH-1 *	5" ROD HGR	MO 283176 SH 37 L 7	↓	
	D	17	1	RH-2 *	5" ↓ ↓	MO 283176 SH 37 L 13	↓	
	D	18	1	SH-2	HOT LOAD 563# 8" SPRING HGR MOVE COLD TO HOT .20" DN.	PO ② 6450-C62	MD-PS	

REMARKS -

* X42 TO REPLACE 5" PIPE WITH 8" PIPE CLAMP (S/25-43-446)

SERVICE - AUXILLIARY EXHAUST

PS-150

APPLICABLE HULLS	613C	614C	615C	GROUP NO.	6451-0104-2105 PI SHT 1 OF 1	DWG NO. 6451-474	SHEET 14	REV. H

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D		1	1	P2AJ	8" IPS X STD THK PIPE STL	PIPE DETAIL 6451-475	PS	
D		2	1	P2AK	↓	↓	↓	
D		3	1	P2AL	↓	↓	↓	
		4	1	P2AM	↓	↓	↓	
		5						
		6						
D		7	1	V-239	8" BACK PRESS & REL 150# FLG STL (MOTOR OPERATED)	PO ① 6451-M2	PS	
C		8	6'-0"	F-7	4"X2.66" X 7.7# I-BEAM STL	S 73-08-204	X10-PS	
		9						
D		10	~~3~~	~~50WS1~~	~~5" BACKING RING STL (STD)~~	~~25-20-940~~	ST-PS	
D		11	3	80WS1	8" BACKING RING STL (STD)	97-18-137		
C		12		HGR Nº				
D		13	1	TR-7 *	5" TIE ROD HGR	MO 283176 SH 37 L1	B10-PS	
D		14	1	SH-1	HOT LOAD 1774# 8" SPRING HGR MOVE COLD TO HOT .46" UP	PO ① 6450-C62	ST-PS	
D		15	~~2~~	~~H-14~~	~~5" SWING HGR (W/EX LEG)~~	~~S 25-49-426~~	↓	
D		16	2	H-14	8" SWING HGR (W/EX LEG)	S/ 25-49-446	ST-PS	
		17						
H		18	1	F9	1/2" BOSS STL. S.W. (COUPLET)	PO ② 6454-C8	ST-PS	

REMARKS -

* X42 TO REPLACE 5" PIPE CLAMP WITH 8" PIPE CLAMP (S/25-43-446)

SERVICE - AUXILLIARY EXHAUST

PS-150

APPLICABLE HULLS	613C	614C	615C	GROUP NO.	6451-0104-2204 PI SHT 1 OF 2	DWG NO. 6451-474	SHEET 15	REV. H

FLANGE JOINT LIST & INSTALLATION GROUP

NN 3569

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
~~D~~	~~1~~	~~8~~			~~BOLTS~~	~~3/4" HVY HEX HEAD L=3 1/4"~~	~~6000-C7 ㉑~~	~~MD-PS~~	
~~D~~	~~2~~	~~8~~	~~5021~~	~~5"~~	~~NUTS~~	~~3/4" HVY HEX~~	~~6000-C11 ③~~		
~~D~~	~~3~~	~~1~~			~~GSKT~~	~~1/16" COMPRESSED ASBESTOS 150#~~	~~15-01-280E~~	~~ST-PS~~	
	4	—			BOLTS	—	—		
	5	8	Z-5	8"	NUTS	3/4" HVY HEX	6000-C11 ③	MD-PS	
	6	1			GSKT	1/16" COMPRESSED ASBESTOS 150#	16-01-284E	ST-PS	
D	7	16			BOLTS	3/4" HVY HEX HEAD L= 4"	6000-C7 ⑳		
D	8	16	8021		NUTS	3/4" HVY HEX	6000-C11 ③		
D	9	2			GSKT	1/16" COMPRESSED ASBESTOS 150#	15-01-284E		
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17		○		NUTS				
	18				GSKT				
	19				BOLTS				
	20		○		NUTS				
	21				GSKT				
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

REMARKS -

SERVICE - AUXILLIARY EXHAUST

PS- 150

GROUP NO.

6451-0104-2204 PI
SHT 2 OF 2

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6451-474 SHEET 16 REV. D

INSTALLATION GROUP

NN 3569

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2X	8" IPS x STD THK PIPE STL	PIPE DETAIL 6451-475	PS	
		2	1 ⊙	P2Y				
		3	1	P2Z				
		4	1 ⊙	P2AN				
C		5	100'-0"	P7	1" IPS	K57-06-104		
C		6	71'-0"	P8	1/2" IPS X"X" HVY THK	K57-07-102		
		7	10'-0"	P9	1/4" IPS	K57-07-100		
		8	4'-0"	P10	3/4" IPS	K57-07-103		
		9	36"	P11	3/8" IPS	K57-07-101		
		10	3	80WS1	8" BACKING RING STL (STD)	97-18-137	ST-PS	
		11	1	100WS1	10"	25-20-962		
		12	2	6UN1	3/4" UNION 300# MI SCRD	25-12-166		
C		13	1	10TS1	1" TEE S.W. 3000# STL	PO ⑫ 6200-M12	MD-PS	
C		14	5	77TRS1	1x1x1/2" TEE	㉗		
C		15	2	62TRS1	1x1/2x1/2	25-60-235 25-60-369	ST-PS	
		16	1	73TRS1	1x3/4x1"	25-60-079 25-60-368		
		17	1	6TS1	3/4"	PO ⑪ 6200-M12	MD-PS	
		18	9	4UN1	1/2" UNION 300# MI SCRD	25-12-164	ST-PS	

REMARKS -
⊙= H615C (ONLY)

SERVICE - AUXILLIARY EXHAUST

PS- 162

GROUP NO.

6451-0104-2107 SI
SHT 1 OF 4

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6451-474 SHEET 17 REV. C

INSTALLATION GROUP

NN 3569

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V236	3/4" GLOBE STOP 250# BRONZE SCRD	PO ④ 6450-C27	MD-PS	
		2	1	V-241		④		
		3	1 *Δ	V-255	8" GATE 150# FLG STL	PO ③A 6451-M3		
		4	1 ⊙	V-255	MOTOR OPER	③		
		5	1 Δ	V256		④A		
		6	1 ⊙	V256	MOTOR OPER	④		
		7	1	V304	1/2" GLOBE STOP 250# BRONZE SCRD	PO ③ 6450-C27		
		8	1	V305				
		9	1	V306				
		10	1	V307				
		11	1	V308				
		12	1	V309				
		13	1	V310				
		14	1	V311				
		15	1	V312				
		16	1	V240	1"	⑤		
		17	7	58RN1	1/2x1/4 RED BUSHING 150# MI SCRD	25-05-324	ST-PS	
		18	2	68RN1	1/2x3/8	25-05-326		

REMARKS - Δ= H613C & H614C *= V255 REQUIRES EXT STEM SEE DWG 257333
⊙= H615C (ONLY)

SERVICE - AUXILLIARY EXHAUST

PS- 162

GROUP NO.

6451-0104-2107 SI
SHT 2 OF 4

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6451-474 SHEET 18 REV. A

INSTALLATION GROUP

NN 3569

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1 Δ	P2AV	8" IPS x STD THK PIPE STL	PIPE DETAIL 6451-475	PS	
		2						
		3						
		4	1 Δ	80JS1	8" FLANGE SLIP-ON 150# STL	PO ① 6450-C34	MD-PS	
		5						
		6						
		7						
		8						
C		9		HGR No				
C		10	1	RH-3	8" ROD HGR	MO 283176 SH38L1	B10-PS	
C		11	2	H-14	8" SWING (W/EX LEG)	S 25-49-446		
C		12	12	H-11	1"	S 25-46-346		
C		13	5	H-11	3/4"	S 25-46-336		
C		14	8	H-11	1/2"	S 25-46-326		
C		15	9	H-1	1/4" FIXED HGR	S 25-40-304		
		16						
		17						
		18						

REMARKS - Δ=H613C & H614C (ONLY)

SERVICE - AUXILLIARY EXHAUST

PS- 162

GROUP NO.

6451-0104-2107 SI
SHT 3 OF 4

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6451-475 SHEET 19 REV. C

FLANGED JOINT LIST & INSTALLATION GROUP

NN 3568

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	32			BOLTS	3/4" HVY HEX HEAD L=3 1/2"	6000-C7 ⑳	MD-PS	
	2	32	8021	8"	NUTS	3/4" HVY HEX	6000-C11 ③		
	3	4			GSKT	1/16" COMPRESSED ASBESTOS 150#	1501-284E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - AUXILLIARY EXHAUST

PS- 162

GROUP NO.

6451-0104-2107 SI
SHT 4 OF 4

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6451-474 SHEET 20 REV. A

& OUTFITTING GROUPS

NN 3569

REV.	LINE	LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
F		1	1	P1A	10" IPS x STD THK PIPE-STL	PIPE DETAIL 6451-475	PS	
F		2	1	P1B				
F		3	1	P1C				
F		4	20'-0"	P8	1/2" IPS x X-HVY THK	57-07-102	ST-PS	
F		5	36"	P9	1/4" IPS	57-07-100		
		6						
F		7	1	V-233	4" ANGLE RELIEF V. 150# FLG-STL (SET AT 85PSIG)	PO Ⓘ-D 6400 T2	ST-PS	
F		8	1	V-235	10" WAFER CHECK-STL	PO ⑤ 6200-M5		
F		9	1	V-242	10" GATE V-150# FLG-STL	PO ㉑ 6451-M3		
J		~~10~~	~~1~~	~~V-313~~	~~1/2" GLOBE V-250# SCRD BRONZE~~	PO ③ ~~6450-C27~~		
J		~~11~~	~~1~~	~~V314~~	~~1/2"~~	③		
		12						
F		13	2	100WS1	10" BACKING RING-STL-STD	S/25-20-962	ST-PS	
J		~~14~~	~~2~~	~~2UN1~~	~~1/4" UNION-300# MI SCRD~~	~~S/25-12-160~~		
J		~~15~~	~~1~~	~~4TS1~~	~~1/2" TEE SW 3000# STL~~	PO ⑩ 6200 M12		
J		~~16~~	~~2~~	~~5BRN1~~	~~1/2"x1/4" BUSHING 150# MI SCRD~~	~~S/25-05-324~~		
J		17	2	~~2EN1~~	1/4" 90° ELL 150# MI-SCRD	S/25-09-190		
J		~~18~~	~~1~~	~~F-2~~	~~PILOT FOR V-251~~	PO ⑪A ~~6450-C10~~		

REMARKS -

SERVICE - AUXILIARY EXHAUST

PS = MC170

GROUP NO.

6451-1601-1004 PI
SHT 1 OF 3

APPLICABLE HULLS 613C 614C

DWG NO. 6451-474 SHEET 21 REV. J

& OUTFITTING GROUPS

NN 3569

REV.	LINE	LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
F		1	1	F-3	PILOT FOR V-205	PO ⑫A 6450-C10	ST-PS	
		2						
		3						
		4						
		5		HGR NO.				
F		6	1	SH-15	HOT LOAD 2258# 10" SPRING HANGER MOVE COLD TO HOT .42" DN	PO ⑪④ 6552-C16	ST-PS	
F		7	2	H-11	1/2" SWING HANGER	S/25-46-326		
F		8	1	H-14	10" SWING HANGER (W/EX LEG)	S/25-49-466		
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - AUXILIARY EXHAUST

PS = MC 170

GROUP NO.

6451-1601-1004 PI
SHT 2 OF 3

APPLICABLE HULLS

DWG NO. 6451-474 SHEET 22 REV. H

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
F	1	12			BOLTS	7/8" HVY HEX HD-STL L=9 1/4"	6000-C7 (54)	ST-PS	
F	2	12	Z-1	10"	NUTS	7/8" HVY-HEX- STL	6000-C11 ④		
F	3	2			GSKT	1/16" COMPRESSED ASBESTOS-150	15-01-286E		
F	4	24			BOLTS	7/8" HVY-HEX HD STL L=3 3/4"	6000-C7 ⑮		
F	5	24	100Z1	10"	NUTS	7/8" HVY-HEX- STL	6000-C11 ④		
F	6	2			GSKT	1/16" COMPRESSED ASBESTOS-150#	15-01-286E		
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - AUXILIARY EXHAUST

PS = MC170

GROUP NO.

6451-1601-1004 PI
SHT 3 OF 3

APPLICABLE HULLS 613C 614C

DWG NO. 6451-474 SHEET 23 REV. F

6451-474

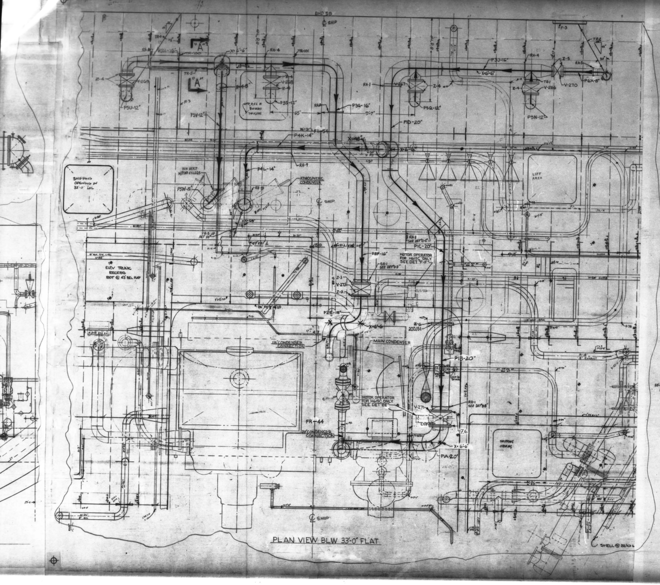
MICRO-MASTER® 105 mm

K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

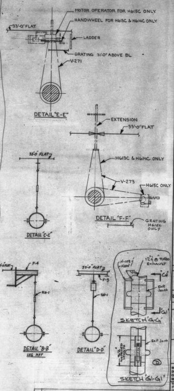
FRAME

8X


BHD 58
℄ SHIP
"A"
"A"
P5U-12"
P5V-12"
P5S-12"
P3G-16"
P3J-16"
P5Q-12"
P5N-12"
P6X-8"
P1D-20"
P4K-14"
P4L-14"
P5W-18"
V-269
V-268
V-267
V-266
V-270
Z-4
Z-5
X-6'-6"
X-4'-8"
LIFT AREA
ATMOSPHERIC CONDENSER
SHIPPING OPENING IN 33'-0" LVL
ELEV TRUNK RECESS BOT @ 43' BEL FLAT
P1C-20"
P3F-16"
MOTOR OPERATOR FOR H615C ONLY SEE DET "F-F"
V-273
Z-3
P2E-18"
18" CONDENSER CONNECTION
MAIN CONDENSER
MOTOR OPERATOR FOR H615C ONLY SEE DET "E-E"
P1B-20"
V-271
Z-6
FR-44
20" CONDENSER CONNECTION
P1A-20"
SHIPPING OPENING
℄ SHIP
SHELL @ 22'-0"

PLAN VIEW BLW 33'-0" FLAT

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHD	OWNER DATE	OWNER APPD
A	—	INITIAL ISSUE	3/16/76		—	—
B	–	PIPE NO CORRECTED FOR OUTLET FROM TURBINE "A"	6/21/76		—	—
C	–	ADDED MOTOR OPERATOR TO V-271 & V-273 FOR H615C ONLY. ADDED DETS "E-E" & "F-F."	6/27/77		—	—
D		ADDED H-103 TO 12" CARGO PUMP TURBINE EXH LINES & H-104 TO 8" BALLAST PUMP TURBINE EXH LINE. (WORK ACCOMP ON 613C) SKETCH "G-G" & "G1-G1" ADDED TO SUIT.	10/30/78		–	–


MOTOR OPERATOR FOR H615C ONLY
HANDWHEEL FOR H613C & H614C ONLY
33'-0" FLAT
LADDER
GRATING 31'-0" ABOVE BL
V-271
DETAIL "E-E"
EXTENSION
33'-0" FLAT
H613C & H614C ONLY
V-273
H615C ONLY
DETAIL "F-F"
GRATING H615C ONLY
33'-0" FLAT
DETAIL "C-C"
F-4
RH-1
DETAIL "B-B"
LKG AFT
33'-0" FLAT
F-3
SH-1
DETAIL "D-D"
H-103
H-104
12" & 8" TURBO EXHAUST
G
G1
EXP. Joint
SKETCH "G-G"
EXP Joint
SKETCH "G1-G1"
D

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCE 1
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REFERENCE 1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. AND REFERENCE 2.
4. BACKING RINGS ~~AND COUPLINGS~~ SHOWN IN LIST OF MAT'L ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMP AND ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REFERENCE 6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REFERENCE 1.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REFERENCE 4.
10. INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REFERENCE 3.
11. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
12. ALL PIPING ON THIS DRAWING IS CLASS II.
13. ALL HOLE CUTS PROVIDED ON STRUCTURAL DWGS.
14. PIPE HANGERS CLAMPS ARE TO BE INSTALLED WITH 2 LAYERS OF 1/8" THICK ASBESTOS LINERS.

FOR LIST OF MATERIAL, SEE DWG 6451-477.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS	ABS
	USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689

SCALE 1/2" = 1 FT
DRAWN Anthony Starkey
CHECKED T.E. SEAMAN
SECT MGR J. Johnson
DATE COMPL. 3-16-76
EXAMINED
AUTHORIZED
DATE 3-16-76
TECH APPROVAL 4-4-76 DBM
C S D APPROVAL R. L. Harrington

NO.	REFERENCES	DWG NO.
6	PAINTING SCHEDULE	8300-40 41
5	LIST OF PRESS & VAC GAGES FURN BY SHIPYARD	6750-483
4	TYPICAL ARR OF GAGE PIPING	6750-481
3	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
2	FABRICATION & WELDING INSTRUCTIONS-CL I & II PP	257035
1	DIAGRAM AUX EXH, BLEED ST & RELIEF VLV ESCAPE	6451-471 472

PIPING ARR- CARGO & BALLAST PUMP TURB EXH SYS-ENG RM PLAN, SECT, & ELEV

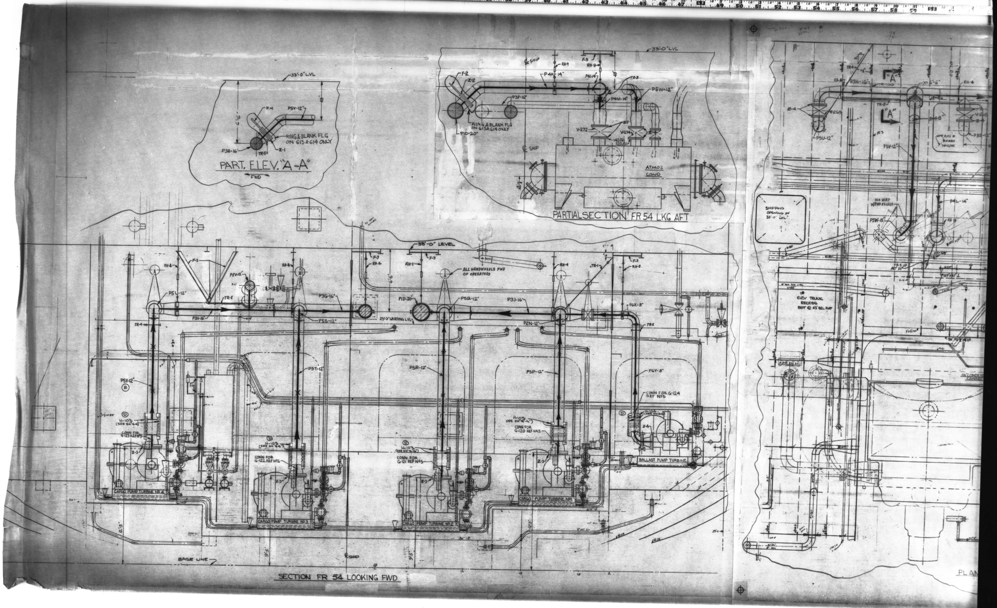
U S M A DESIGN T11-S-1168
U S M A DWG NO.
HULL NO.

DWG NO. 6451-476
REV D
SHEET NO. 1 OF 1

GROUP:
MC NO.

6451.476

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO
SEPT. '80
FRAME 1
10X


PART. ELEV. "A-A"
FWD
33'-0" LVL
F-1
P5V-12"
RING & BLANK FLG ON 613 & 614 ONLY
P3H-16"
TR-5
Z-1
PARTIAL SECTION FR 54 LKG AFT
33'-0" LVL
℄ SHIP
F-2
Z-2
P4K-14"
P4L-14"
P3F-16"
P5W-12"
P4M-14"
RING & BLANK FLG ON 613 & 614 ONLY
P1D-20"
V-272
V-274
ATMOS COND
SECTION FR 54 LOOKING FWD
33'-0" LEVEL
ALL HANDWHEELS FWD OF OPERATORS
RH-4
F-3
P5V-12
P5U-12"
TR-5
P3H-16"
P5S-12"
P3G-16"
P1D-20"
P5Q-12"
P3J-16"
P6X-8"
P2N-12"
25'-3" GRATING LVL
TR-4
P5Z-12"
P5T-12"
P5R-12"
P5P-12"
P6Y-8"
H-103
CONN FOR G-123 REF NºS
CONN FOR G-122 REF NºS
CONN FOR G-121 REF NºS
CONN FOR G-120 REF NºS
CONN FOR G-124 REF NºS
CARGO PUMP TURBINE Nº 4
CARGO PUMP TURBINE Nº 3
CARGO PUMP TURBINE Nº 2
CARGO PUMP TURBINE Nº 1
BALLAST PUMP TURBINE
Z-3
Z-4
BASE LINE
℄ SHIP
SHIPPING OPENING IN 33'-0" LVL
"A"
P3H-16"
P5U-12"
P5V-12"
P5W-12"
P4L-14"
ELEV TRUNK RECESS
PLAN

6451.476

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 2
10X

6451-477

CSD VAULT
X163

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 10-30-8
SIGNED J H Johnson

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS									
REV.	E	E	C	A	E	A	C	E	E
SHEET	1	2	3	4	5	6	7	8	9

GROUP
MC NO.

DWG. REV. — HULL APPLIC.

REV.	613	614	615
A	YES	YES	YES
B	Yes	Yes	Yes
C	Yes	Yes	Yes
D	YES	Yes	Yes
E	YES	YES	NO

NNS & DDCo. HULL No.	MARAD HULL No.	USMA DESIGN
615C	311	T11-S-116a
614C	310	
613C	309	

SHIP'S NAME

APPROVALS
OWNERS
ABS NR
USCG NR

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689

COMMERCIAL SHIP DESIGN DEPT.
INSTALLATION GROUP : 6451-0104-1002 PI
6451-0104-1003 SI

ARR DWG 6451-476
PIPE DET 6451-478 ← H613&614
6451-507 ← H615

SCALE NONE =1 Ft.
DRAWN ANTHONY STARKEY
CHECKED TE SEAMAN
SECT. MGR. J H Johnson
DATE COMPL. 3-16-76
EXAMINED E E Stephenson
AUTHORIZED
DATE 3-16-76
TECH. APPROVAL NR
CSD APPROVAL R. L. Vanington

GROUPED / DATES: BY, CHK., COMP., PART
HULL 613C GROUP NO. KEY
TYPE OF DWG. —

TITLE PIPING ARR CARGO & BALLAST PUMP TURBINE EXHAUST SYSTEM-ENGINE ROOM L/M

DWG. NO. 6451-477 REV E SHEET NO. 1 OF 9

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D.	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE RJP	3/16/76	JHJ	—	—
B	7	CORRECTED PIPE NO LINE 8&9 ADDED LINE 10 TES	5/21/76	JHJ	—	—
C	3,7	ADDED PIPE DETAIL NO FOR H615	10/24/77	JHJ		
D	8	LINE 3; ALT'D SOURCE - WAS 6451-C34	5/18/78	JHJ	—	—
E	5	ADDED HOT LOAD & VERT MOVE TO L.13				
	8 9	ADDED L'S 15 & 16. QTY'S FOR L'S 7,8 & 9 WERE 40,80 & 2 RESPECT. S/M FOR L.9 WAS NO. 257320 S.2, L.1. (WORK ACCOMP ON 613C.)	10/30/78	JHJ	—	—

NOTES:

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF #1.

NO.	REFERENCES	DWG. NO.
1	DIAGRAM - AUX EXH, BLEED ST. & RELIEF VLV ESCAPE - LIST	6451-472

HULL NO 613C, 614C, 615C DWG. NO. 6451-477 REV E
SHEET 2 OF —

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1C	20"IPS X STD THK PIPE STL H613&614 → H615 →	PIPE DETAIL 6451-478 6451-507	PS	
		2	1	P1D	↓	↓	↓	
		3	1	P3F	16"IPS	↓	↓	
		4	1	P3G	↓	↓	↓	
		5	1	P3H	↓	↓	↓	
		6	1	P3J	↓	↓	↓	
		7	1	P4K	14"IPS	↓	↓	
		8	1	P4L	↓	↓	↓	
		9	1	P5N	12"IPS	↓	↓	
		10	1	P5Q	↓	↓	↓	
		11	1	P5S	↓	↓	↓	
		12	1	P5U	↓	↓	↓	
		13	1	P5V	↓	↓	↓	
		14	1	P6X	8"IPS	↓	↓	
		15						
		16						
		17						
		18						

REMARKS –

SERVICE - PUMP TURBINE EXHAUST
MC NO PS 150
GROUP NO. 6451-0104-1002 PI SHT 1 OF 4
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-477 SHEET 3 REV. C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1 Δ	F-1	12" FLANGE RING & BLANK 150# STL	MO 257339 S1 L12	ST-PS	
		2	1 Δ	F-2	14" ↓	S1 ↓ L13	↓	
		3	1	200WS1	20" BACKING RING STL (STD)	97-18-157	↓	
		4	3	160WS1	16"	97-18-152	↓	
		5	1 Δ 2 ⊙	140WS1	14"	25-20-976	↓	
		6	1 ⊙	120WS1	12 ↓	97-18-144	↓	
		7						
		8	1	V-266	12" GATE 150# FLG STL MOTOR OPER	PO ⑦ 6451-M3	MD-PS	
		9	1	V-267	12"	⑧	↓	
		10	1	V-268	12"	⑨	↓	
		11	1	V-269	12"	⑩	↓	
		12	1	V-270	8"	⑪	↓	
		13	1 ⊙	V-273	16"	⑭	↓	
		14	1 Δ	V-273 *	16" ↓	(14A) ↓	↓	
		15						
		16						
		17						
		18						

REMARKS - Δ-H613C & H614C ONLY *-V-273 REQUIRES EXT STEM SEE DWG 257333
⊙-H615C ONLY

SERVICE - PUMP TURBINE EXHAUST
MC NO PS 150
GROUP NO. 6451-0104-1002 PI SHT2 OF 4
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-477 SHEET 4 REV. A

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	40'-0"	F-3	3"X3"X3/8" ANGLE STL	MO 6451-466 SH6 L17	ST-PS	
		2	2	RH-1	20" ROD TYPE HANGER	MO 6451-466 SH3 L1	↓	
		3			↓			
		4	4	RH-4	16" ↓	MO 6451-466 SH 3 L8	ST-PS	
		5	1	RH-5	8" ↓	MO 6451-466 SH 4 L1	↓	
		6			↓			
		7			↓			
		8			↓			
		9	2	RH-9	14" ↓	MO 6451-466 SH 4 L9	ST-PS	
		10						
		11	1	TR-1	12" TIE ROD TYPE HANGER 1 1/2" DIA. ROD	MO 6451-466 SH 5 L1	ST-PS	
		12	1	TR-5	↓ 1 1/4" DIA ROD	MO 6451-466 SH 7 L1	↓	
E		13	1	SH-1	SIZE 16" HOT LOAD 2725 VERT MOVE COLD-HOT .03" UP	PO ① 6552-C16	MD-PS	
		14	1	H-14	12" SWING TYPE HANGER	MO 257320 S7 L14	ST-PS	
		15	1	TR-3	14" TIE ROD TYPE HANGER 3/4" DIA. ROD	MO 6451-466 SH 6 L1	↓	
		16						
		17						
		18						

REMARKS –

SERVICE - PUMP TURBINE EXHAUST
MC NO PS 150
GROUP NO. 6451-0104-1002 PI SHT 3 OF 4
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-477 SHEET 5 REV. E

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	12	Z-1 Δ	12"	BOLTS STUD	7/8" CONTINUOUS THD L=5 3/4"	21-18-604	ST-PS	
	2	24			NUTS	7/8" HVY HEX	21-31-106	↓	
	3	2			GSKT	1/16" COMPRESSED ASBESTOS	15-01-290E	↓	
	4	12	Z-2 Δ	14"	BOLTS STUD	1" CONTINUOUS THD L=6 1/4"	21-18-629	↓	
	5	24			NUTS	1" HVY HEX	21-31-108	↓	
	6	2			GSKT	1/8" COMPRESSED ASBESTOS	15-01-335E	↓	
	7	16	Z-3	16"	BOLTS STUD	1" CONTINUOUS THD L=5 3/4"	21-18-626	↓	
	8	32			NUTS	1" HVY HEX	21-31-108	↓	
	9	1			GSKT	1/8" COMPRESSED ASBESTOS	15-01-336E	↓	
	10	96	Z-4	12"	BOLTS STUD	7/8" CONTINUOUS THD L=5"	21-18-598	↓	
	11	192			NUTS	7/8" HVY HEX	21-31-106	↓	
	12	8			GSKT	1/16" COMPRESSED ASBESTOS	15-01-290E	↓	
	13	16	Z-5	8"	BOLTS STUD	3/4" CONTINUOUS THD L=4 1/2"	21-18-568	↓	
	14	32			NUTS	3/4" HVY HEX	21-31-104	↓	
	15	2			GSKT	1/16" COMPRESSED ASBESTOS	15-01-284E	↓	
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20		○		NUTS				
	21				GSKT				
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

REMARKS - Δ-H613C & H614C ONLY

SERVICE - PUMP TURBINE EXHAUST
MC NO PS 150
GROUP NO. 6451-0104-1002 PI SHT4 OF 4
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-477 SHEET 6 REV. A

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1A	20"IPS X STD THK PIPE STL H613&614 → H615 →	PIPE DETAIL 6451-478 6451-587	PS	
		2	1	P1B	↓	↓	↓	
		3	1	P2E	18"IPS	↓	↓	
		4	1	P4M	14"IPS	↓	↓	
		5	1	P5P	12"IPS	↓	↓	
		6	1	P5R	↓	↓	↓	
		7	1	P5T	↓	↓	↓	
B		8	1	P5Z	↓	↓	↓	
B		9	1	P6Y	8"IPS	↓	↓	
B		10	1	P5W	12"IPS	↓	↓	
		11						
		12	1 Δ	V-271	20" GATE 150# FLG STL	PO (12A) 6451-C3	MD-PS	
		13	1 ⊙	V-271	20" MOTOR OPER	⑫	↓	
		14	1 Δ	V-272	14"	(13A)	↓	
		15	1 ⊙	V-272	14" MOTOR OPER	⑬	↓	
		16	1 Δ	V-274	12"	(15A)	↓	
		17	1 ⊙	V-274	12" MOTOR OPER	⑮	↓	
		18						

REMARKS - Δ-H613C & H614C ONLY
⊙-H615C ONLY

SERVICE - PUMP TURBINE EXHAUST
MC NO PS 170
GROUP NO. 6451-0104-1003 SI SHT 1 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-477 SHEET 7 REV. C

INSTALLATION GROUP

REV.		LINE	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	200JS1	20" FLANGE 150# RF SLIPON STL	PO ⑱ 6450-M2	MD-PS	
		2	1	140JS1	14" ↓	↓ ⑮	↓	
D		3	1	120JS1	12" ↓	PO ⑤ 6450-C34	↓	
		4	1	200WS1	20" BACKING RING STL (STD)	97-18-157	ST-PS	
		5	1	180WS1	18"	97-18-156	↓	
		6	1	140WS1	14"	25-20-976	↓	
		7	4	120WS1	12" ↓	97-18-144	↓	
		8						
		9						
		10	7'0"	F-3	3"X3"X3/8" ANGLE STL	MO 6451-466 SH6 L17	ST-PS	
		11	54'	F-4	6"X4"X8.5# I STL	MO 6451-466 SH6 L18	↓	
		12	1	RH-1	20" ROD TYPE HANGER	MO 6451-466 SH 3 L1	↓	
		13	1	TR-2	8" TIE ROD TYPE HANGER 3/4" ROD	MO 6451-466 SH 5 L9	↓	
		14	1	TR-4	12" ↓ 3/4" ROD	MO 6451-466 SH 6 L9	↓	
E		15	8	H-103	SPECIAL HGR FOR 12" EXPANSION JOINT	MO 6451-466 S.2 L.1	↓	
E		16	2	H-104	↓ 8"	MO 6451-466 S.2 L.8.	↓	
		17						
		18						

REMARKS –

SERVICE - PUMP TURBINE EXHAUST
MC NO PS 170
GROUP NO. 6451-0104-1003 SI SHT 2 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-477 SHEET 8 REV. E

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	80	Z-3	16"	BOLTS STUD	1" CONTINUOUS THD L=5 3/4"	21-18-626	ST-PS	
	2	160			NUTS	1" HVY HEX	21-31-108	↓	
	3	5			GSKT	1/8" COMPRESSED ASBESTOS	15-01-336E	↓	
	4	36	Z-4	12"	BOLTS STUD	7/8" CONTINUOUS THD L=5"	21-18-598	↓	
	5	72			NUTS	7/8" HVY HEX	21-31-106	↓	
	6	3			GSKT	1/16" COMPRESSED ASBESTOS	15-01-290E	↓	
E	7	60	Z-6	20"	BOLTS STUD	1 1/8" CONTINUOUS THD L=6 1/2"	21-18-654	↓	
E	8	120			NUTS	1 1/8" HVY HEX	21-31-109	↓	
E	9	3			GSKT	1/16" COMPRESSED ASBESTOS	5/64" 15-09-234E	↓	
	10	24	Z-7	14"	BOLTS STUD	1" CONTINUOUS THD L=5 1/2"	21-18-624	↓	
	11	48			NUTS	1" HVY HEX	21-31-108	↓	
	12	2			GSKT	1/8" COMPRESSED ASBESTOS	15-01-335E	↓	
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17		○		NUTS				
	18				GSKT				
	19				BOLTS				
	20		○		NUTS				
	21				GSKT				
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

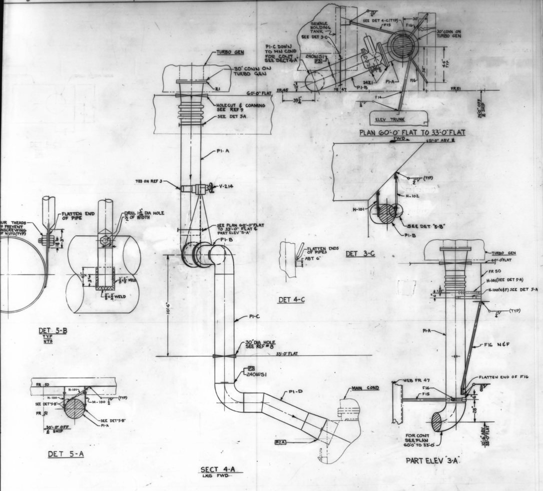
REMARKS –

SERVICE - PUMP TURBINE EXHAUST
MC NO PS 170
GROUP NO. 6451-0104-1003 SI SHT 3 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-477 SHEET 9 REV. E

6451-477

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80
FRAME
8X


TURBO GEN
30" CONN ON TURBO GEN
21
60'-0" FLAT
HOLECUT & COAMING SEE REF 9
SEE DET 5A
P1-A
TSS ON REF 3
V-214
SEE PLAN 60'-0" FLAT TO 33'-0" FLAT & PART ELEV "3-A"
P1-B
P1-C
10'-6"
30" DIA HOLE SEE REF 8
33'-0" FLAT
P3
240WS1
P1-D
MAIN COND
P2A
SECT 4-A
LKG FWD
SEWAGE HOLDING TANK
SEE DET 3-C
SEE DET 4-C (TYP)
F15
F16
30" CONN ON TURBO GEN
P1-C DOWN TO MN COND FOR CONT SEE SECT 4-A
240WS1
P3
12"
FR 45
FR 47
39 1/4"
24Z1
P1-B
P1-A
30"
4'-4" TYP
54"
FR 51
F14
ELEV TRUNK
26'-0" OFF ℄ SHIP
PLAN 60'-0" FLAT TO 33'-0" FLAT
FWD
51'-0" ABV ℄
(TYP)
H-102
H-101
SEE DET "5-B"
P1-B
FLATTEN ENDS OF PIPES
ABT 6"
DET 3-C
DET 4-C
TURBO GEN
60'-0" FLAT
FR 50
H-101 (SEE DET 5-A)
H-100 (N&F) SEE DET 5-A
(TYP)
P1-A
F16 N&F
WEB FR 47
F14
F15
FLATTEN END OF F16
6"
28"
10'-6" ABV 33'-0" FLAT
FOR CONT SEE PLAN 60'-0" TO 33'-0"
PART ELEV "3-A"
FLATTEN END OF PIPE
DRILL 1 1/2" DIA HOLE 1/2 OF WIDTH
UR THEADS
O PREVENT
NSCREWING
F NUTS (TYP)
WELD
DET 5-B
TYP
NTS
FR 50
H-101
H-100
SEE DET "5-B"
H-100
(TYP)
FR 51
SEE DET "5-B"
P1-A
30'-0" OFF ℄ SHIP
DET 5-A

REVISIONS						
REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
A	-	INITIAL ISSUE	10/3/75	[illegible]	—	—

AUTHORITY:

GENERAL NOTES:

1. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REFERENCE 2 FOR LIST OF ACCEPTABLE MATERIALS.
2. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE USCG, ABS AND REFERENCE 6.
3. ALL BUTT WELDS ARE P-3, SLIP-ON FLANGES P-16A & ARE IN ACCORDANCE WITH REFERENCE 6 UNLESS OTHERWISE NOTED.
4. BACKING RINGS SHOWN IN LIST OF MATERIAL ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THAT SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMPS AND ETC.
6. PAINTING IS TO BE IN ACCORDANCE WITH REF 4.
7. TESTS ARE TO BE IN ACCORDANCE WITH REF 2.
8. HANGERS INDICATED ON PLAN ARE TO BE INSTALLED WITHIN 6 INCHES OF POSITION LOCATED ON DWG. NO ADDITION HANGERS MAY BE ADDED WITHOUT DESIGN APPROVAL.
9. ALL PIPING ON THIS DWG IS CLASS II IN ACCORDANCE WITH REFERENCE 6.

FOR LIST OF MAT'L SEE
NN DWD 6451-480

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS

OWNERS

ABS

USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689

NO.	REFERENCES	DWG NO.
9	MACHY FLAT 78'-4" ABV ℄ FR 35½-58 INBD 39'-0" BHD	1140-91
8	MACHY FLAT 33'-0" ABV ℄ FR 35½-58 INBD 39'-0" BHD	1090-52
7	DIRECTIONS FOR INSULATING & LAGGING PIPES & MAC	257322
6	FAB & WELDING INSTRUCTION FOR CL I & II PIPING	257035
5	STD PIPE HGR & INSTALLATION INSTRUCTION	257056
4	PAINTING SCHEDULE	8300-35
3	LIST OF THERM FURN BY SHIPYARD	6750-482
2	DIAG EXH, LP BLEED ST & RELIEF VALVE ESC L/M	6451-472
1	DIAG EXH, LP BLEED ST & RELIEF VALVE ESC ARR	6451-471

SCALE 1/2 = 1 FT
DRAWN L.A. MCNEIL
CHECKED H.H. EDGE
SECT MGR J.K. Johnson
DATE COMPL. 10-3-75
EXAMINED
AUTHORIZED
DATE 10-3-75
TECH APPROVAL
C S D APPROVAL R.L. Harrington

PIPING ARR TURBO GEN EXH
ENGINE ROOM

U S M A DESIGN T-11-S-16a
U S M A DWG NO. —
HULL NO. —

DWG NO.	REV	SHEET NO.
6451-479	A	1 OF 1

DWG. REV — HULL APPLIC

REV	NN HULLS ONLY		
A	YES	YES	YES

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING YES
REMARKS
DATE 6-15-7 SIGNED J.K. Johnson

YARD PRINTS

ORDERED BY DESIGN

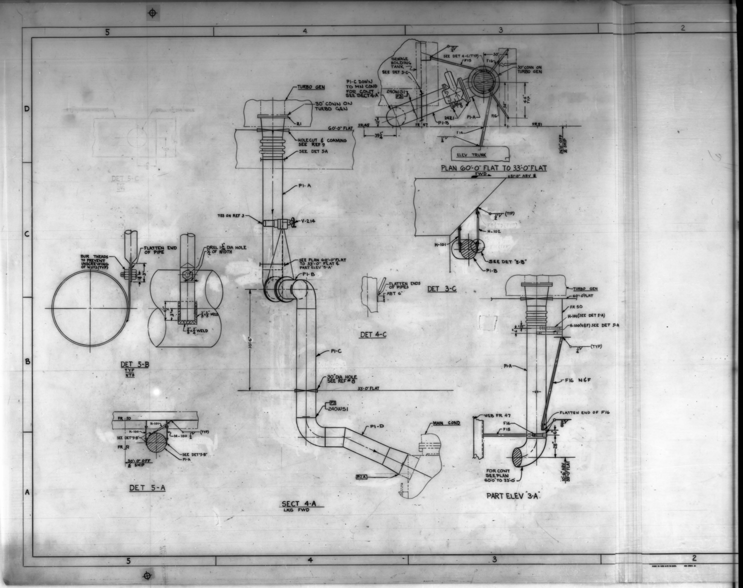
GROUP:
MC NO.

6451-479

MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80
FRAME 1
10X


5
4
3
2
D
C
B
A
TURBO GEN
30" CONN ON TURBO GEN
21
60'-0" FLAT
HOLECUT & COAMING SEE REF 9
SEE DET 5A
P1-A
T-33 ON REF 3
V-214
SEE PLAN 60'-0" FLAT TO 33'-0" FLAT & PART ELEV "3-A"
P1-B
10'-6"
P1-C
30" DIA HOLE SEE REF #8
33'-0" FLAT
P3
240WS1
P1-D
MAIN COND
P2A
SECT 4-A
LKG FWD
SEWAGE HOLDING TANK
SEE DET 3-C
P1-C DOWN TO MN COND FOR CONT SEE SECT 4-A
SEE DET 4-C(TYP)
F15
F16
30"
30" CONN ON TURBO GEN
4'-4" TYP
54"
2421
P1-A
P1-B
FR 45
FR 47
FR 51
12"
39 1/4"
F14
ELEV TRUNK
26'-0" OFF ℄ SHIP
PLAN 60'-0" FLAT TO 33'-0" FLAT
FWD
51'-0" ABV ℄
1/2 (TYP)
H-102
H-101
SEE DET "5-B"
P1-B
DET 3-C
FLATTEN ENDS OF PIPES
ABT 6"
DET 4-C
BUR THEADS TO PREVENT UNSCREWING OF NUTS(TYP)
FLATTEN END OF PIPE
3"
1 1/4"
DRILL 1 1/16" DIA HOLE
1/2 OF WIDTH
4 1/2"
3"
3/8 x 3/8 WELD
3/8 x 3/4 WELD
DET 5-B
TYP
NTS
FR 50
H-101
H-100
SEE DET "5-B"
FR 51
H-100
1/2 (TYP)
SEE DET "5-B"
P1-A
30'-0" OFF ℄ SHIP
DET 5-A
TURBO GEN
60'-0" FLAT
FR 50
H-101(SEE DET 5-A)
H-100(N&F) SEE DET 5-A
1/4 (TYP)
P1-A
F16 N&F
FLATTEN END OF F16
WEB FR 47
F14
F15
6"
28"
FOR CONT SEE PLAN 60'-0" TO 33'-0"
10'-6" ABV 33'-0" FLAT
PART ELEV "3-A"

6451-479

MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 2

10X

6451. 480

~~ENB~~ CSD VAULT

X 163

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 10-26-8
SIGNED J. K. Johnson

YARD PRINTS — ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS						
REV.	B	B	A	A	B	A
SHEET	1	2	3	4	5	6

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
A	YES	YES	YES
B	YES	YES	NO

NNS&DDCO. HULL No.	MARAD HULL No.	USMA DESIGN
615C	311	
614C	310	
613C	309	T11-S-116a

SHIP'S NAME

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP DESIGN DEPT

ARR DWG NO 6451-479
INSTALLATION GROUP 6451-0115-1201

SCALE NONE =1 Ft.
DRAWN L.A.MCNEIL
CHECKED H.M.EDGE
SECT. MGR. J. K. Johnson
DATE COMPL. 10-3-75
EXAMINED
AUTHORIZED E. E. Stephenson
DATE 10-3-75
TECH. APPROVAL NR
CSD APPROVAL R. L. Harrington

GROUPED BY CHK.
DATES PART COMP.
HULL 613C KEY GROUP NO.
TYPE OF DWG. —

TITLE
PIPING ARR TURBO GEN EXH
LIST OF MAT'L

DWG. NO. 6451-480 REV B SHEET NO. 1 OF 6

37 NN 8½ X 14

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D.	OWNER DATE	OWNER APPD.
A	-	INITIAL ISSUE	10/3/75	JHJ	—	—
B	5	ALTERED SOURCE OF MAT'L LINES 2,3 & 4.	10/26/8	JHJ		

NOTES

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF #1

NO.	REFERENCES	DWG. NO.
1	DIAG AUX EXH, BLEED ST, RELIEF VALVE ESCAPE L/M	6451-472

HULL NO. 613C, 614C, 615C DWG. NO. 6451-481 SHEET 2 OF -

NN46 8½ X 14

NN 3569 INSTALLATION GROUP

REV.	LINE	LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1-A	24" IPS x STD PIPE	PMO 6451-481	PS	
		2	1	P1-B	↓	↓	↓	
		3	1	P1-C	↓	↓	↓	
		4	1	P1-D	↓	↓	↓	
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS - MAT'L FOR ARR DWG 6451-479

SERVICE - TURBO GEN EXHAUST

MC NO PS

GROUP NO. 6451-0115-1201 SHT 1 OF 4

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6451-480 SHEET 3 REV. A

NN 3569 INSTALLATION GROUP

REV.	LINE	LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V-214	24" GATE FLG 150# DUCTILE IRON	PO ② 6451-CS	MD-PS	
		2						
		3						
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS - MAT'L FOR INSTALLATION DWG 6451-479

SERVICE - TURBO GEN EXHAUST

MC NO PS 173

GROUP NO. 6451-0115-1201 SHT 2 OF 4

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6451-480 SHEET 4 REV. A

NN 3569 & OUTFITTING GROUPS

REV.	LINE	LINE NO.	QTY (1 SHIP)	FITT. NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	3	240WS1	24" STEEL BACKING RING	S1 25-20-998	ST-PS	
B		2	1	F14	PIPE SUPPORT. 2½" X-HVY STL PIPE 7'-0" LONG	S1 57-07-108	↓	
B		3	1	F15	PIPE SUPPORT. 2½" X-HVY STL PIPE 6'-6" LONG	↓	↓	
B		4	2	F16	PIPE SUPPORT. 2½" X-HVY STL PIPE 10'-6" LONG	↓	↓	
		5						
		6	2	H-100	HANGER. DET "3-A" ON 6451-466 L=15"	MO 6451-466 SH.1 L.1	ST-PS	
		7	2	H-101	HANGER. DET "3-B" ON 6451-466 L=19"	MO 6451-466 SH.1 L.7	↓	
		8	1	H-102	HANGER. DET "3-B" ON 6451-466 L=38"	MO 6451-466 SH.1 L.13	↓	
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

MC NO PS 173

GROUP NO. 6451-0115-1201 SH. 3

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6451-480 SHEET 5 REV. B

NN 3569 INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	28	Z2	30"	BOLTS	STUD 1¼" ALLOY STL L=7½"	21-18-686	ST-PS	
	2	56			NUTS	1¼" HVY HEX STL	21-33-212	↓	
	3	1			GSKT	1/16" THK COMPR ASB 150#	SY/S 15-09-224	↓	
	4	40	Z3	24"	BOLTS	STUD 1¼ ALLOY STL L=7'	21-18-682	↓	
	5	80			NUTS	1¼ HVY HEX STL	21-33-212	↓	
	6	2			GSKT	1/16 THK COMPR ASB 150#	SY/S 15-09-224	↓	
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS - MAT'L FOR ARR DWG 6451-479

SERVICE - TURBO EXH

MC NO - PS 173

GROUP NO. 6451-0115-1201 SHT 4 OF 4

APPLICABLE HULLS 613C 614C 615C

DWG NO. 6451-480 SHEET 6 REV. A

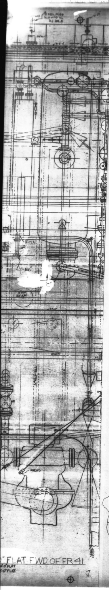
6451-480

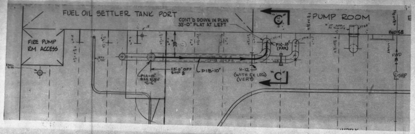
MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
® Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80

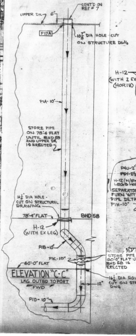
FRAME

8X

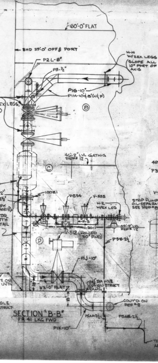

"FLAT FWD OF FR 41


FUEL OIL SETTLER TANK PORT
FIRE PUMP RM ACCESS
CONT'D DOWN IN PLAN 33'-0" FLAT AT LEFT
"C"
PUMP ROOM
BHD 58
P1C-10" (FAR)
FWD
℄ SHIP
P1A-10" SEE ELEV "C-C"
25'-6" OFF SHIP ℄
P1B-10"
H-12 (WITH EX LEG) (VERT)
"C"

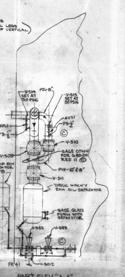
PARTIAL PLAN 60'-0" FLAT & ABOVE


CONT'D ON REF # 7
UPPER DK
6"
P17A
10 7/8" DIA HOLE CUT ON STRUCTURE DWG
P1A-10"
STORE PIPE ON 78'-4 FLAT UNTIL BHD 58 AND UPPER DK IS ERECTED
16 1/4" DIA HOLE CUT ON STRUCTURAL DRAWING
78'-4" FLAT
BHD 58
H-12 (WITH EX LEG)
P1B-10"
P1C-10"
60'-0" FLAT
STORE PIPE ON 60'-0" FLAT UNTIL BHD 58 IS ERECTED
16 1/2" DIA HOLE CUT ON STRUCT DWG
12"
P1D-10"

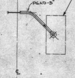
ELEVATION "C-C"
LKG OUTBD TO PORT
FWD


60'-0" FLAT
BHD 39'-0" OFF ℄ PORT
P2L-8"
P3-1/2"
H-14 W/2EX LEGS (SLOPE ALL LEGS 10° PORT OF VERTICAL AXIS
P1G-10"
P1H-10"&8" (W&F)
H-12 (WITH 2 EX LEGS) (HORIZ)
Ⓑ
46'-2" LVL GATING REF 12
Ⓒ
P4U-2"
P5Y-2 1/2"
100E1
V-534
V-535
H-12 (W/EX LEGS HORIZ)
H-2 W/EX LEG
SEPARATOR FURN WITH PIPE DETAIL P1H-10"
F-3
V-5011
59'-9" LVL REF 12
V-512 (ROLLED 30° FWD)
Ⓓ
P5Z-2 1/2"
P1J-10"
33'-0" FLAT
24 1/2" DIA HOLE CUT ON STRUCT DWG
CONT'D ON REF #8
P5AA-2 1/2
P5AE-2 1/2"
P1K-10"
TERMINATE Y=17'-0" ABV ℄

SECTION "B-B"
FR 41 LKG FWD


V-514 SET AT 50 PSIG
P2L-8"
V-515 SET AT 50 PSIG
4US1
P3-1/2"
4US1
P3-1/2"
Ⓒ
V-510
V-509
GAGE CONN FOR GB8 ON REF 11 Ⓔ
STRIP PUMP EXH OIL-SEPARATOR SEE REF #8
P1H-10" & 8"
V-511
DECK MACH'Y EXH OIL-SEPARATOR
GAGE GLASS FURN WITH SEPARATOR
V-552
V-553
Ⓒ
F-4
FR 41
V-5012

PART. ELEV. "A-A"
PORT LKG OUTBD
FWD


CONTAMINATED DRAIN & INSPECTION TANK
P5AD-3"
℄
33'-0" LVL

PART. SECT "C-C"
FR 50 LKG FWD

REVISIONS

REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHO	OWNER DATE	OWNER APPD
A	—	INITIAL ISSUE	4/29/76	[illegible]	—	—
B	-	DESIGN DEVELOPMENT: ALTERED DETAIL LETTERS FOR ALL 8" PIPE TO MATCH PIPE DETAIL DWG. ALT'D P1H-10"+8", P1G-10" AND OFFSET IN P2L-8" TO CLEAR STRUCTURE @ FR 41. RBW ADDED: P2T-8" ALTERED P2P-8", P2Q-8", P2R-8" & P2N-8" RBW	6/15/7	[illegible]	—	—
C	-	PLAN 33'-0" FLAT FWD FR 41: ADDED DRAINS FROM STRIP PUMP & DECK MACHY OIL-SEPARATOR TO CONTAM. DRN & INSPECT. TANK. SECT B-B & PART ELEV ALT'D TO SUIT. ADDED SPECIAL HGRS	12/6/7	[illegible]	—	—
D	—	SECT 'B-B' ALT'D P1J-10"	4/24/8	[illegible]		
E	-	PART ELEV "A-A", GB8 WAS GB1.				

TO JRL 7/7/76
TO JRL 8-11-76

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCES 1 AND 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REFERENCE 1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. AND REFERENCE 3.
4. BACKING RINGS AND COUPLINGS SHOWN IN LIST OF MAT'L ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMP AND ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REFERENCE 6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REFERENCE 1.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REFERENCE 4.
10. INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REFERENCE 5.
11. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
12. ALL PIPING ON THIS DRAWING IS CLASS I.
13. DIMENSIONS SHOWN ON THIS PLAN ARE FOR REFERENCE AND MAY BE ALTERED SLIGHTLY TO SUIT INSTALLATION.
14. ALL WELDS ON THIS DWG ARE P3 FOR BUTT WELDS, P16A FOR FLANGES AND P14 FOR SOCKET WELDS IN ACCORDANCE WITH REF 3 UNLESS OTHERWISE NOTED.

REVISION APPLICABILITY

REV	N.N. HULL NO. 613C	N.N. HULL NO. 614C		
A	YES	YES		
B	YES	YES		
C	YES	YES		
D	YES	YES		

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 2-24-8 SIGNED J.K. Johnson

FOR LIST OF MATERIAL, SEE DWG 6451-486

NN S & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C 613C	310 309	

APPROVALS

OWNERS	
	ABS NOT REQ'D
	USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689

NO.	REFERENCES	DWG NO.
12	ARR OF FLOOR PLTS, GRATING & LADDERS 33'-0"-60'-0"	6650-294
11	LIST OF GAGES FURN BY SHIPYARD	6750-483
10	PIPING ARR CONTAM ST DR SYS - ENG RM	6555-469
9	DECK PIPING AFT FR 58	2400-976
8	PIPING ARR - STRIPPING PUMP EXHAUST - ENG RM	6451-488
7	STM & EXH UPPER DK FR 58-73 ARR	6450-773
6	PAINTING SCHEDULE	8300-40
5	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
4	TYPICAL ARRANGEMENT OF GAGE PIPING	6750-481
3	FABRICATION & WELDING INSTRUCTIONS CL I & II PIPING	257035
2	↑ ↑ ↑ ↑ - ARR	6450-692
1	DIAGRAM - CONTAM STEAM GEN SYS - LIST	6450-693

SCALE 1/2 INCH = 1 FT
DRAWN Anthony Starkey
CHECKED H.M. EDGE
SECT MGR J.H. Johnson
DATE COMPL. 4-29-76
EXAMINED
AUTHORIZED
DATE 4-30-76
TECH APPROVAL 3-11-76
C S D APPROVAL

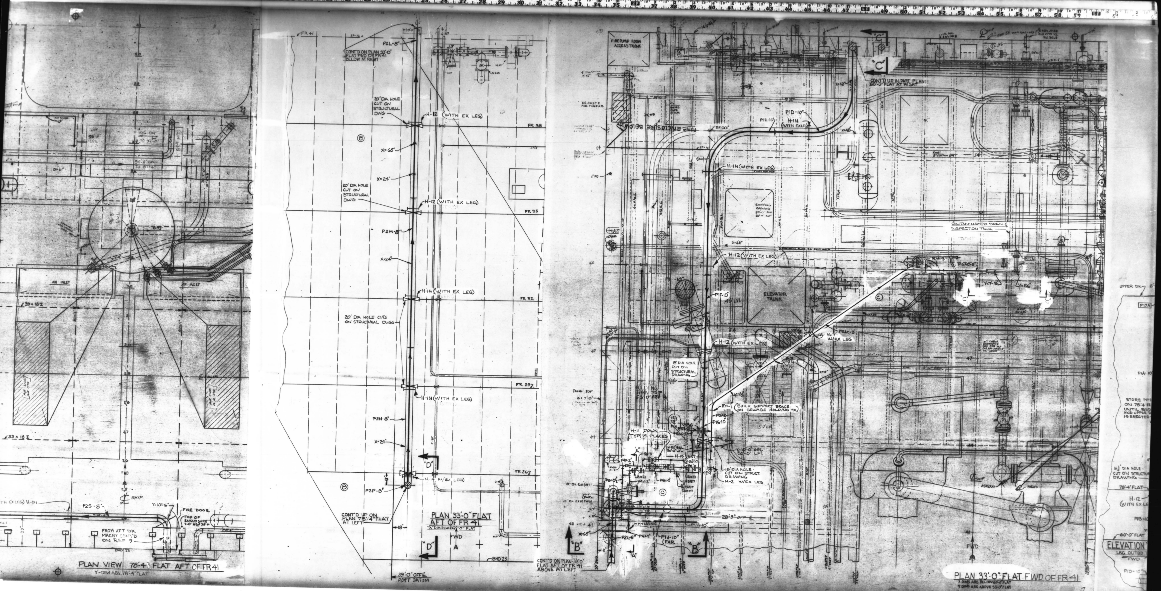
PIPING ARR - DECK MACHINERY
EXHAUST IN ENGINE ROOM
PLAN, SECT, & ELEV

U S M A DESIGN TII-S-1168
U S M A DWG NO.
HULL NO. —
DWG NO. 6451-485
REV D
SHEET NO. 1 OF 1

6451.485

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

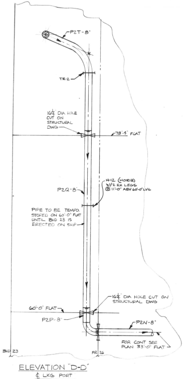
SEPT. '80
FRAME 1
10X


PLAN VIEW 78'-4" FLAT AFT OF FR41
Y-DIM ABV. 78'-4" FLAT
AIR INLET
33 x 18 I
FIRE DOOR
TOP OF ENCLOSURE
FROM AFT DK MACHY CONT'D ON REF 9
℄ SHIP
FWD
P2S-8"
Y-10'-6"
H-14
BHD 23
CONT'D ON PLAN 33'-0" FLAT FWD OF FR41 BELOW AT RIGHT
P2L-8"
20" DIA HOLE CUT ON STRUCTURAL DWG
H-12 (WITH EX LEG)
X=65"
X=24"
P2M-8"
H-14 (WITH EX LEG)
20" DIA HOLE CUTS ON STRUCTURAL DWGS
P2N-8"
P2P-8"
H-14 W/EX LEG)
FR 41
FR 38
FR 35
FR 32
FR 29½
FR 26¾
"D"
CONT'D UP ON PLAN 78'-4" FLAT AT LEFT
PLAN 33'-0" FLAT AFT OF FR 41
"X" DIM BLW 60'-0" FLAT
39'-0" OFF ℄ PORT DATUM
BHD 23
CONT'D ON PLAN 33'-0" FLAT AFT OF FR 41 ABOVE AT LEFT
FIREPUMP ROOM ACCESS TRUNK
PUMP ENCLOSURE BELOW
"C"
CONT'D UP IN PART PLAN 60'-0" FLAT AT RIGHT
P1D-10"
P1E-10"
H-14 (WITH EX LEG)
H-14 (WITH EX LEG)
CONTAMINATED DRAIN & INSPECTION TANK
H-12 (WITH EX LEG)
ELEVATOR TRUNK
P1F-10"
H-12 (WITH EX LEG)
H-7 W/EX LEG
18" DIA HOLE CUT ON STRUCTURAL DRAWING
RH-1 (BUILD SUPPORT BRACE ON SEWAGE HOLDING TK)
P1G-10"
H-11 DOWN (TYP) 15 PLACES
H-15
18" DIA HOLE CUT ON STRUCT. DRAWING
H-2 W/EX LEG
TANK TOP
P2L-8"
P1J-10" (FAR)
P1H-10"
"B"
"B"
"A"
FWD
ASTERN
AHEAD
PLAN 33'-0" FLAT FWD OF FR 41
X DIMS ARE BELOW 60'-0" FLAT
Y DIMS ARE ABOVE 33'-0" FLAT
UPPER DK
P17A
P1A-10"
STORE PIPE ON 78'-4" FLAT UNTIL BULKD AND UPPER DK IS ERECTED
16½" DIA HOLE CUT ON STRUCTURAL DRAWING
78'-4" FLAT
H-12 (WITH EX LEG)
P1B-10"
60'-0" FLAT
ELEVATION
LKG OUTBD
FWD
P1D-10"

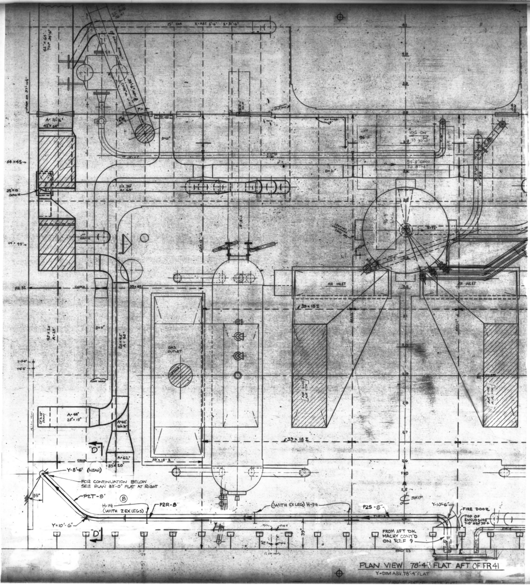
6451.485

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.

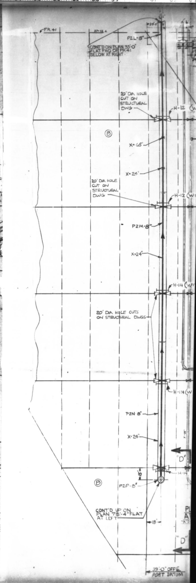
SEPT. '80
FRAME 2
10X


P2T-8"
TR-2
16¾" DIA HOLE CUT ON STRUCTURAL DWG
78'-4" FLAT
H-12 (HORIZ) W/2 EX LEGS @11'-0" ABV 60'-0" LVL
P2Q-8"
PIPE TO BE TEMPO. STORED ON 60'-0" FLAT UNTIL BHD 23 IS ERECTED ON SHIP
16¾" DIA HOLE CUT ON STRUCTURAL DWG
60'-0" FLAT
P2P-8"
P2N-8"
FOR CONT SEE PLAN 33'-0" FLAT
BHD 23
FR 26

ELEVATION "D-D"
℄ LKG PORT
FWD


15" DIA
64 x 45
25 x 15 DOWN
FR 32
AIR INLET
AIR INLET
39 x 18 I
GAS OUTLET
"D"
Y-8'-6" (NEAR)
FOR CONTINUATION BELOW SEE PLAN 33'-0" FLAT AT RIGHT
P2T-8"
H-14 (WITH 2 EX LEGS)
P2R-8"
(WITH EX LEG) H-14
P2S-8"
Y-10'-6"
Y-10'-6"
FIRE DOOR
TOP OF ENCLOSURE
FROM AFT DK MACHY CONT'D ON REF 9
℄ SHIP
FWD
BHD 23
"D"

PLAN VIEW 78'-4" FLAT AFT OF FR41
Y-DIM ABV. 78'-4" FLAT


FR 41
P2L-8"
CONT'D ON PLAN 33'-0" FLAT FWD OF FR 41 BELOW AT RIGHT
20" DIA HOLE CUT ON STRUCTURAL DWG
H-12
X=65'
X=24'
20" DIA HOLE CUT ON STRUCTURAL DWG
H-12
P2M-8"
X=24'
H-14
20" DIA HOLE CUTS ON STRUCTURAL DWGS
H-14
P2N-8"
X=24'
"D"
P2P-8"
CONT'D UP ON PLAN 78'-4" FLAT AT LEFT
"D"
39'-0" OFF ℄ PORT DATUM

6451.485

SEPT. '80
FRAME 3
10X

6451-486

MICRO-MASTER® 105 mm
K+E
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ALEXANDRIA • RICHMOND • NORFOLK
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SEPT. '80

FRAME

8X

6451-486 CSD-VAULT
E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 3-23-78
SIGNED

YARD PRINTS
ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2.

REV. STATUS OF SHEETS														
REV.	E	E	C	A	C	E	C	C	C	C	C	C	C	D
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	11A	13

GROUP
MC NO.

DWG. REV. — HULL APPLIC.

REV.	613	614
A	YES	YES
B	YES	YES
C	YES	YES
D	Yes	Yes
E	YES	YES

NNSB&DDCO HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C 613C	310 309	T11-S-116a	

APPROVALS
OWNERS
ABS NOT REQ'D
USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division FSCM NO. 43689
COMMERCIAL SHIP DESIGN DEPT

ARR DWG - 6451-485
PIPE DETAILS-6451-487 6451-0110-1201-PI
INSTALLATION GROUPS-6451-0105-1217-PI
6451-0113-1218-PI 6451-0112-1219-PI
6451-0117-2220-PI 6451-0114-1221-PI
6451-0405-1222-PI 6451-0106-1227 SI

SCALE NONE =1 Ft.
DRAWN ANTHONY STARKEY
CHECKED H.M. EDGE
SECT. MGR. J. H. Johnson
DATE COMPL. 4-29-76
EXAMINED
AUTHORIZED E. E. Stephens
DATE 4-30-76
TECH. APPROVAL NR
CSD APPROVAL R. L. Harrington

GROUPED BY CHK. DATES COMP. PART HULL GROUP NO. KEY
TYPE OF DWG. —

TITLE PIPING ARR-DECK MACH'Y EXHAUST IN ENGINE ROOM LIST OF MATERIAL

DWG. NO. 6451-486 REV E SHEET NO. 1 OF 13

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	AUTH'D	OWNER DATE	APPD.
A	ALL	INITIAL ISSUE. RJP	4/29/76		—	—
B	5,8,&9	ALTERED: PIPE No's P2L,M,N,P,Q,R,&S WERE P2A,B,C,D,E,F,&G RESPECTIVELY. WAS	6/15/77			
C	3 5 6 7 8 9	ADDED LINES 14 5,12,13,14,&18 13,&14 14 13,14,&16 14,15,&16				
	10,11,12	ADDED SHTS 10,11&12 WG	12/6/77			
	11A	ADDED			—	—
D	13 6	ADDED DELETED DETAIL C ON LINE 1 CHANGED GROUP - WAS 6451-0112-1219 PI PTV	2/24/78		—	—
E	6	ALTERED INSTALLATION GROUP NO.	3/23/78		—	—

NOTES:
1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF No1.

852

NO.	REFERENCES	DWG. NO.
1	DIAGRAM-CONTAM STEAM GEN SYSTEM-LIST	6450-693

HULL NO. 613C, 614C DWG. NO. 6451-486 REV E SHEET 2 OF —

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1J	10"IPS X STD STL PIPE	PMD 6451-487	PS	
		2	1	P1K	10"IPS ↓ ↓ ↓	↓	↓	
		3						
		4						
		5						
		6		VALVE No				
		7	1	V512	10" GATE 150# FLG'D STL MOTOR OPER	FURN WITH PIPE DET ON 6451-487	PS	
		8						
		9						
		10						
		11		FITTING No				
		12	2	100WS1	10" BACKING RING STD STL	25-20-962	ST-PS	
		13						
C		14	1	H-12	10" SWING HGR W/EX LEG	S 25-47-466	ST-PS	
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - DECK MACH'Y EXHAUST
GROUP NO. PS-152 6451-0105-1217 PI SHT 1 OF 2
APPLICABLE HULLS 613C 614C
DWG NO. 6451-486 SHEET 3 REV. C

FLANGED JOINT LIST & OUTFITTING GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	12			BOLTS	7/8" HVY HEX HD STL L=3¾"	6000-C7 ⑮	MD-PS	
	2	12	10021	10"	NUTS	7/8" ↓ ↓ ↓	6000-C11 ④	↓	
	3	1			GSKT	1/16" THK COMP ASB 150#	15-01-280E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - DECK MACHY EXHAUST
GROUP NO. PS-152 6451-0105-1217-PI SHT 2 OF 2
APPLICABLE HULLS 613C 614C
DWG NO. 6451-486 SHEET 4 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1G	10"IPS X STD STL PIPE	PMD 6451-487	PS	
		2	1	P1H	↓ ↓ ↓ ↓ ↓	↓	↓	
B		3	1	P2L	8"IPS			
		4	24"	P3	1/2" IPS X X-HVY STL PIPE	K57-07-102		
C		5	1	H-14	10" SWING HGR W/2 EX LEG	S 25-49-466	ST-PS	
		6		VALVE No				
		7	1	V509	10" GATE 150# FLG'D CARBON STL	FURN WITH PIPE DET ON 6451-487	PS	
		8	1	V510	8"			
		9	1	V511	10" ↓	↓	↓	
		10	1	V514	1/2" SENTINEL RELIEF SCR'D CARBON STL	PO ⑩ 6450-C7	MD-PS	
		11	1	V515	↓	⑪ ↓	↓	
C		12	2	H-12	10" SWING HGR (W/2 EX LEG)	S 25-47-466	ST-PS	
C		13	1	H-12	8" ↓ ↓	S 25-47-446		
C		14	1	H-12	8" SWING HGR W/EX LEG	↓	↓	
		15	2	4US1	1/2 UNION SCR'D 600# CARBON STEEL	PO ㊹ 6200-M12	MD-PS	
		16	1	80WS1	8" BACKING RING STD STL	97-18-139	ST-PS	
		17	2	100WS1	10" ↓ ↓ ↓ ↓	25-20-962	↓	
C		18	1	H-13	10" SWING HGR	S 25-48-466	ST-PS	

REMARKS -

SERVICE - DECK MACHY EXHAUST
GROUP NO. PS-152 6451-0113-1218-PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C
DWG NO. 6451-486 SHEET 5 REV. C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D		~~1~~	~~1~~	~~P1C~~	10"IPS X STD PIPE STL	PMD 6451-487	PS	
		2	1	P1D	↓ ↓ ↓ ↓ ↓	↓	↓	
		3	1	P1E				
		4	1	P1F				
		5						
		6						
		7						
		8		FITTING No				
		9	4	100WS1	10" BACKING RING STD STL	25-20-962	ST-PS	
		10						
		11						
		12		HGR No				
C		13	2	H-12	10" SWING HGR (W/ EX LEG)	S 25-47-466	ST-PS	
C		14	2	H-14	10" SWING HGR (W/EX LEG)	S 25-49-466	↓	
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - DECK MACHY EXHAUST
GROUP NO. PS-149 6451-0115-1219-PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C
DWG NO. 6451-486 SHEET 6 REV. E

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1A	10"IPS X STD PIPE STL	PMD 6451-487	PS	
		2	1	P1B	10"IPS ↓ ↓ ↓	↓	↓	
		3						
		4						
		5						
		6						
		7		FITTING No				
		8	1	100WS1	10" BACKING RING STD STL	25-20-962	ST-PS	
		9						
		10						
		11						
		12						
		13		HGR No				
C		14	2	H-12	10" SWING HGR (W/EX LEG)	S 25-47-466	ST-PS	
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - DECK MACHY EXHAUST
GROUP NO. PS-155 6451-0117-2220-PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C
DWG NO. 6451-486 SHEET 7 REV. C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	1	P2M	8"IPS X STD STL PIPE	PMD 6451-487	PS	
B		2	1	P2N	↓ ↓ ↓ ↓ ↓	↓	↓	
B		3	1	P2P				
B		4	1	P2Q				
		5						
		6						
		7						
		8						
		9		FITTING No				
		10	5	80WS1	8" BACKING RING STD STL	97-18-137	ST-PS	
		11						
		12		HGR No				
C		13	1	H-12	8" SWING HGR (W/EX LEG)	S 25-47-446	ST-PS	
C		14	3	H-14	8" SWING HGR (W/EX LEG)	S 25-49-446	↓	
		15						
C		16	1	H-12	8" SWING HGR (W/2 EX LEGS)	S 25-47-446	ST-PS	
		17						
		18						

REMARKS -

SERVICE - DECK MACHY EXHAUST
GROUP NO. PS-152 6451-0114-1221-PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C
DWG NO. 6451-468 SHEET 8 REV. C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	1	P2R	8"IPS X STD PIPE STL	PMD 6451-487	PS	
B		2	1	P2S	↓ ↓ ↓ ↓	↓	↓	
B		3	1	P2T				
		4						
		5						
		6						
		7						
		8						
		9		FITTING No				
		10	3	80WS1	8" BACKING RING STD STL	97-18-137	ST-PS	
		11						
		12						
		13		HGR No				
C		14	2	H-14	8" SWING HGR W/EX LEG	S 25-49-446	ST-PS	
C		15	1	H-14	↓ ↓ ↓ W/2 EX LEGS	S 25-49-446		
C		16	1	TR-2	8" TIE ROD HGR	MO 283176 534 L4	↓	
		17						
		18						

REMARKS -

SERVICE - DECK MACHY EXHAUST
GROUP NO. PS-147 6451-0405-1222-PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C
DWG NO. 6451-486 SHEET 9 REV. C

6451-486

MICRO-MASTER® 105 mm

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SEPT. '80

FRAME

8X

GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P4U	2" IPS x STD PIPE STL	PMO 6451-487	PS	
		2	1	P4V				
		3	1	P4W				
		4	1	P4X				
		5	1	P5Y	2½"			
		6	1	P5Z				
		7	1	P5AA				
		8	1	P6AB	3"			
		9	1	P6AC				
		10	1	P6AD				
		11		VALVE NO				
		12	1	V-532	2" GATE 150# FLG'D STL			
		13	1	V-533				
		14	1	V-534				
		15	1	V535				
		16	1	V536	2½" GLOBE STOP 150# FLG'D STL			
		17	1	V537	¼ GLOBE STOP SW 600# STL	PO ① 6450-C9	ST-PS	
		18	1	V5011	2" GLOBE STOP 150# FLG'D STL	PMO 6451-487	PS	

REMARKS -

SERVICE - DECK EXH & STRIP PUMP OIL-SEPARATOR DRAINS

GROUP NO. 6451-0105-1227 SI SHT 1 OF 3

APPLICABLE HULLS 613C 614C

DWG NO. 6451-486 SHEET 10 REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V-5012	2" GLOBE STOP 150# FLG'D STL	PMO 6451-487	PS	
		2	1	V-5070	2" SWING CHK 150# FLG'D STL			
		3	1	V-5071				
		4	1	F-3	1¼" TRAP W/FILTER			
		5	1	F-4	1" TRAP W/FILTER			
		6		HGR NO				
		7	5	H-13	3" SWING TYP HGR W/ ¼ LINER	S/ 25-47-396	ST-PS	
		8	10	H-12	2"	S/ 25-47-376		
		9	5	H-12	2½	S/ 25-47-386		
		10	1	P5AE	2½" IPS x STD PIPE STL	PMO 6451-487	PS	
		11	1	20WS1	2" BACKING RING STD STL	S/ 97-18-122	ST-PS	
		12	3	2AWS1	2½"	S/ 97-18-124		
		13	3	30WS1	3"	S/ 97-18-126		
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - DECK EXH & STRIP PUMP OIL-SEPARATOR DRAINS

GROUP NO. 6451-0105-1227 SI SHT 2 OF 3

APPLICABLE HULLS 613C 614C

DWG NO. 6451-486 SHEET 11 REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	H-11	2½" SWING HGR	S 25-46-386	ST-PS	
		2	10	H-11	2"	S 25-46-376		
		3	2	H-11	1¼"	S 25-46-356		
		4	2	H-11	1"	S 25-46-346		
		5	5	H-12	2½"	S 25-47-386		
		6	1	H-12	2"	S 25-47-376		
		7	2	H-2	3" FIXED HGR W/EX LEG	S 25-41-392		
		8	1	H-7	3"	S 25-45-392		
		9	1	RH-1	3" ROD HGR	MO 283176 S41 L1	ST-PS	
		10	1	RH-2	3"	MO 283176 S41 L7		
		11	1	RH-3	3"	MO 283176 S41 L13		
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - DK EXH & STRIP PMP OIL SEPARATOR DR

GROUP NO. 6451-0105-1227 SI SH 2A OF 3

APPLICABLE HULLS 613C 614C

DWG NO. 6451-486 SHEET 11A REV. C

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	8	2021	2"	BOLTS	⅝" HVY HEX HD STL L= 2½"	PO 6000-C7 (27)	ST-PS	
	2	8			NUTS	⅝" HVY HEX STL	PO 6000-C12 (18)		
	3	2			GSKT	1/16" THK COMP ASBESTOS 150#	15-01-270E		
	4	4	24Z1	2½"	BOLTS	⅝" HVY HEX HD STL L= 2¾"	PO 6000-C13 (50)		
	5	4			NUTS	⅝" HVY HEX STL	PO 6000-C12 (18)		
	6	1			GSKT	1/16" THK COMP ASBESTOS 150#	15-01-272E		
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - DECK EXH & STRIP, PUMP OIL-SEPARATOR DRAINS

GROUP NO. 6451-0105-1227 SI SHT 3 OF 3

APPLICABLE HULLS 613C 614C

DWG NO. 6451-486 SHEET 12 REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D		1	1	PIC	10" IPS X STD PIPE STL	PMO 6451-487	PS	
		2						
		3						
		4						
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

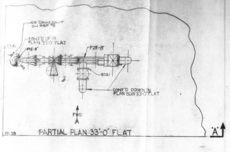
REMARKS -

SERVICE - DECK MACHY EXHAUST

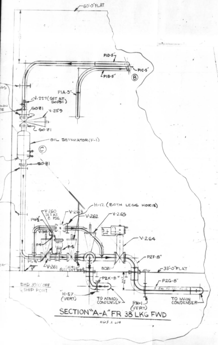
GROUP NO. 6451-0110-1201-PI

APPLICABLE HULLS 613C 614C

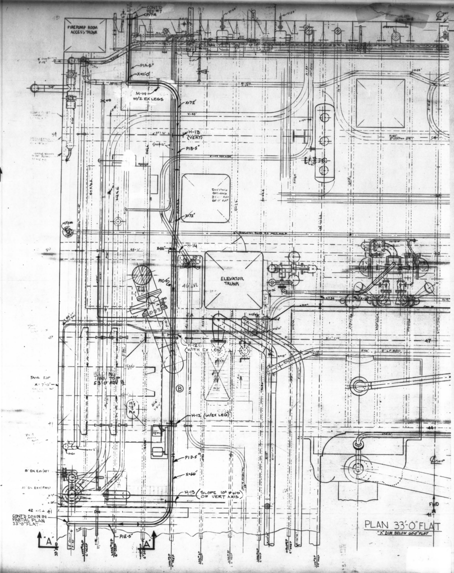
DWG NO. 6451-486 SHEET 13 REV. D


OR CONN CONT ON REF 8
CONT'D UP IN PLAN 33'-0" FLAT
P1E-5"
P2F-8"
8021
CONT'D DOWN IN PLAN BLW 33'-0" FLAT
FWD
"A"
FR 38

PARTIAL PLAN 33'-0" FLAT


60'-0" FLAT
P1D-5"
P1B-5"
P1C-5"
(B)
P1A-5"
V-227 (SET AT 50 PSI)
8021
V-259
OIL SEPARATOR (F-1)
(C)
H-12 (BOTH LEGS HORIZ)
V-260 SET AT 8 PSIG
V-263
V-262
V-265
V-264
P2F-8"
V-261
33'-0" FLAT
P2K-8"
P2G-8"
BHD 35'-0" OFF ⊄ SHIP PORT
H-57 (VERT)
TO ATMOS CONDENSER
PH-1 (VERT)
TO MAIN CONDENSER

SECTION "A-A" FR 38 LKG FWD


FIREPUMP ROOM ACCESS TRUNK
CONT'D REF #7
P1A-5"
X=111'-0"
H-14 W/2 EX LEGS
X=72"
H-13 (VERT)
P1B-5"
X=72"
H-14
X=66"
P1C-5"
ELEVATOR TRUNK
46' LVL
H-12 (WITH EX LEG)
(B)
H-12 (W/EX LEG)
P1D-5"
X=66"
H-13 (SLOPE 10° FWD OF VERT AXIS)
CONT'D DOWN IN PARTIAL PLAN 33'-0" FLAT
P1E-5"
"A"
FWD
⊄ SHIP
54
51
47
44
41
42

PLAN 33'-0" FLAT

"X" DIM BELOW 66'-0" FLAT

NN C.O.#	REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTH	OWNER DATE	OWNER APPD
	A	–	INITIAL ISSUE	4/29/76	[illegible]	—	—
	B	-	DESIGN DEVELOPMENT: ALTERED P3M-10" & P3L-10" TO SUIT HOLE CUT IN FR 44 PORT. RBW				
613 + 614 #48		–	ALTERED P1C-5" & P1D-5"	6/15/77	[illegible]	–	–
	C		ALT'D HEIGHT OF OIL-SEPARATOR; ALT'D ORIENTATION OF V259. ADDED SPECIAL HGRS THROUGHOUT	11/2/77	[illegible]	–	–
	D	-	ADDED PRESSURE SENSING LINE FOR V-260 MODIFIED HANGERS	12/6/77	[illegible]		

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCES 1 AND 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REFERENCE 1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. AND REFERENCE 3.
4. BACKING RINGS AND COUPLINGS SHOWN IN LIST OF MAT'L ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMP AND ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REFERENCE 6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REFERENCE 1.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REFERENCE 4.
10. INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REFERENCE 5.
11. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
12. ALL PIPING ON THIS DRAWING IS CLASS II.
13. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS, BUTT WELDS TYPE P-3 & SOCKET WELDS TYPE R-14 ON REF #3 EXCEPT AS OTHERWISE INDICATED.
14. ALL HOLE CUTS ARE PROVIDED ON STRUCTURAL DWGS.
15. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.

FOR LIST OF MATERIAL, SEE DWG 6451-489

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C 613C	310 309	

APPROVALS
OWNERS
ABS NOT REQD
USCG NOT REQD

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP DESIGN DEPT.
FSCM NO. 43689

NO.	REFERENCES	DWG NO.
9	PIPE ARR CONTAM STM DRN SYS ENG RM	6555-469
8	PIPING ARR - DECK MACH'Y EXH IN ENG RM	6451-485
7	CARGO OIL & SEGREGATED BALLAST SYSTEM IN PUMP ROOM - ARR	2600-79
6	PAINTING SCHEDULE	8300-40
5	DIRECTIONS FOR INSULATING & LAGGING PIPING & AUX	257322
4	TYPICAL ARRANGEMENT OF GAGE PIPING	6750-481
3	FABRICATION & WELDING INSTRUCTIONS CL I & II PIPING	257035
2	↑ ↑ ↑ ↑ ↑ -ARR	6451-471
1	DIAGRAM - AUX EXH, L.P. BLEED ST & R.V. ESCAPE - LIST	6451-472

SCALE 1/2 INCH = 1 FT
DRAWN Anthony Starkey
CHECKED T.E. Seaman
SECT MGR J.H. Johnson
DATE COMPL 4-29-76
EXAMINED —
AUTHORIZED F.F. Stephenson
DATE 4-29-76
TECH APPROVAL 3/11/76
C S D APPROVAL R. L. Harrington

PIPING ARR - STRIPPING PUMP EXHAUST IN ENGINE ROOM PLAN, SECT. & ELEV

U S M A DESIGN T11-S-116a
U S M A DWG NO. —
HULL NO. —
DWG NO. 6451-488
REV D
SHEET NO. 1 OF 1

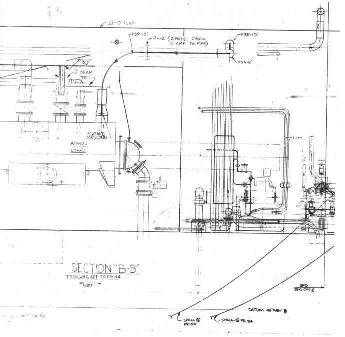
DWG REV-HULL APPLIC
N N HULLS ONLY

REV	[illegible]	[illegible]
A	YES	YES
B	YES	YES
C	YES	YES
D	YES	YES

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 12-6-7 SIGNED J.H. Johnson
YARD PRINTS
ORDERED BY DESIGN
GROUP:
MC NO.

6451.488

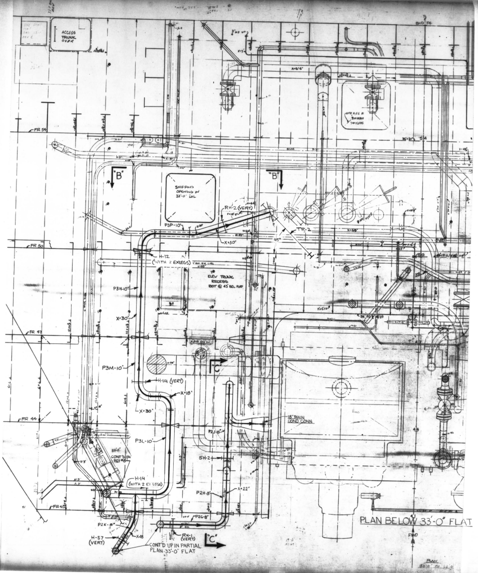
SEPT. '80
FRAME 1
10X


33'-0" FLAT
P3P-10"
RH-2 (2 RODS, CHOCK CLAMP TO PIPE)
P3M-10"
P3N-10"
I-BEAM
TR-2
14" ATMOS COND CONN
ATMOS COND
BHD 39'-0" OFF ℄
DATUM 48" ABV B
SHELL @ FR 50
SHELL @ FR 54

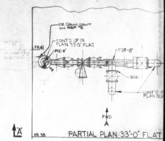
SECTION "B-B"

FR 53 LKG AFT TO FR 44

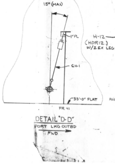
PORT


ACCESS TRUNK OVER
BHD 56
FR 54
"B"
SHIPPING OPENING IN 33'-0" LVL
"B"
RH-2 (VERT)
P3P-10"
TR-2
45°
X=30"
FR 50
H-12 (WITH 2 EXLEGS)
ELEV TRUNK RECESS BOT @ 45' BL FLAT
P3N-10"
X=30"
FR 47
P3M-10"
"C"
H-14 (VERT)
X=18"
X=30"
18" MAIN COND CONN
FR 44
P3L-10"
P2J-8"
SH-2
CONT'D ON REF #8
H-14 (WITH 2 EX LEGS)
X=22"
P2H-8"
P2G-8"
P2K-8"
H-57 (VERT)
X-18
RH-1 (VERT)
CONT'D UP IN PARTIAL PLAN-33'-0" FLAT
"C"
FWD

PLAN BELOW 33'-0" FLAT


DE CONN CONT ON REF #8
CONT'D UP IN PLAN 33'-0" FLAT
FR 41
P1E-8"
P2F-8"
SO21
CONT'D D PLAN BLV
FWD
"A"
FR 38

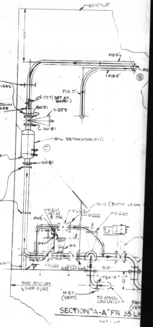
PARTIAL PLAN 33'-0" FLAT


15° (MAX)
1"PL
SH-1
33'-0" FLAT
FR 41

DETAIL "D-D"

PORT LKG OUTBD

FWD


60'-0" FLAT
P1D-5"
P1B-5"
B
H-12 W/2 EX LEGS
V-227 (SET AT 50 PSI)
GAGE CONN G-125, SEE REF #4
SO21
V-259
SO21
OIL SEPARATOR (F-1)
DRN. REF #8
SO21
H-12 (HORIZ) W/2 EX LEGS
V-260 SET AT 8 PSIG
V-263
H-12 (BOTH LEGS
V-262
V-265
P4
F4
F5
ANCHOR
V-261
SO21
P2K-8"
BHD 35'-0" OFF ℄ SHIP PORT
H-57 (VERT)
TO ATMOS CONDENSER

SECTION "A-A" FR 38 LK

6451.488

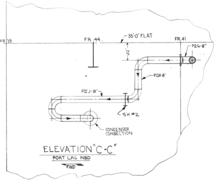
MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

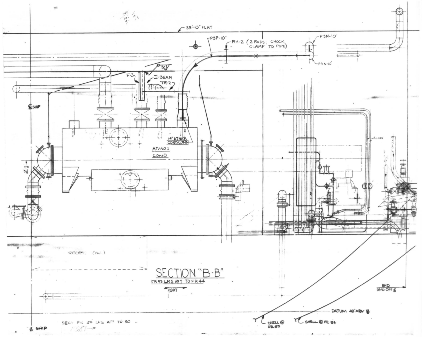
FRAME 2

10X


FR 38
FR 44
33'-0" FLAT
FR 41
22"
P2G-8"
P2H-8"
P2J-8"
SH #2
CONDENSER CONNECTION
FWD

ELEVATION "C-C"

PORT LKG INBD


33'-0" FLAT
P3P-10"
RH-2 (2 RODS, CHOCK CLAMP TO PIPE)
P3M-10"
P3N-10"
F-2
I-BEAM
TR-2
℄ SHIP
14" ATMOS COND CONN
ATMOS COND
RECESS (P.W.)
PORT
BHD 39'-0 OFF ℄
DATUM 48' ABV ℄
SHELL @ FR 50
SHELL @ FR 54
℄ SHIP
SECT FR 54 LKG AFT TO 50

SECTION "B-B"

FR 53 LKG AFT TO FR 44

6451.488

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 3
10X

6451-489   CSD Vault E

REPRODUCTION OFFICE	
YARD PRINTS	YES
REMARKS	
GROUPING	YES
DATE	12-6-7?
SIGNED	

YARD PRINTS   ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS										
REV.	D	D	D	C	D	A	D	A	D
SHEET	1	2	3	4	5	6	7	8	5A

GROUP
MC NO.

NNS&DDCO HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C	310		
613C	309	T11-S-1168	

DWG. REV. — HULL APPLIC.	NN HULLS ONLY	
REV.	613	614
A	YES	YES
B	YES	YES
C	YES	YES
D	YES	YES

APPROVALS

OWNERS	ABS NOT REQ'D
	USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP DESIGN DEPT.

INSTALLATION GROUP: 6451-0104-1226 SI
6451-0104-1225 PI
6451-0105-1223 PI
6451-0112-1224 SI

ARR DWG 6451-488
PIPE DET 6451-490

SCALE NONE =1 Ft.
DRAWN ANTHONY STARKEY
CHECKED I.E. SEAMAN
SECT. MGR. J. K. Johnson
TECH. APPROVAL NR
DATE COMPL. 4-29-76
EXAMINED —
AUTHORIZED E. E. Stephenson
DATE 4-29-76
CSD APPROVAL R. L. Harrington

HULL 613C   GROUP NO.   KEY
GROUPED   DATES   PART   COMP.   BY   CHK.
TYPE OF DWG. ——

TITLE PIPING ARR - STRIPPING PUMP EXHAUST IN ENGINE ROOM LIST OF MATERIAL

DWG. NO. 6451-489   REV D   SHEET NO. 1 OF 8

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE. RJD	4/29/6	JKY	—	—
B	7	ADDED LINE 5 TES	8/11/6	JKJ*	—	-
C	3 4 7 5A	ADDED LINES 15,16,17,18,11 ADDED LINE 9 ADDED LINES 12,13,14,15 ADDED SHEET	11/2/7	AC JKJ*	—	—
D	5 5A	ADDED LINE 14 ADDED LINES 10,11,12,&13				
	3 5A 7	ALTERED LINE 18; WAS H-12 ALTERED LINE 3; WAS 10" ALTERED LINE 6; WAS H-12 ALTERED LINE 13; QTY WAS 5 DELETED LINES 12 & 14 ADDED LINES 11, 16,17, & 18	12/6/7	AC JKJ*	—	—

NOTES:
1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF No 1.

NO.	REFERENCES	DWG. NO.
1	DIAGRAM- AUX EXH, BLEED ST, & RELIEF VLV ESCAPE - LIST	6451-472

HULL NO. 613C, 614C   DWG. NO. 6451-489   REV "D"   SHEET 2 OF —

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2J	8" IPS X STD THK PIPE STL	PIPE DETAIL 6451-490	PS	
		2	1	P3M	10" IPS ↓	↓	↓	
		3	1	P3P	↓	↓	↓	
		4.						
		5						
		6	1	180WSI	18" BACKING RING STL (STD)	97-18-156	ST-PS	
		7	1	140WSI	14"	25-20-976	↓	
		8	3	100WSI	10"	25-20-962	↓	
		9	1	80WSI	8" ↓	97-18-137	↓	
		10						
C		11	3'	F-Z	4"X2.66"X7.7# I-BEAM	S 73-08-204	PS	
		12						
		13						
		14		HGR No				
C		15	1	RH-2	10" ROD HGR	MO 283176 S32 L1	B10-PS	
C		16	1	TR-2	10" TIE ROD HGR	MO 283176 S83L7	↓	
C		17	1	SH-2	8" SPRING HGR	PO (93) 6552-C16	MD-PS	
D		18	1	H-14	10" SWING HGR	S 25-49-466	ST-PS	

REMARKS –

mc No. PS 162

SERVICE - STRIPPING PUMP EXHAUST   GROUP NO. 6451-0104-1226 SI SHT 1 OF 1
APPLICABLE HULLS 613C 614C   DWG NO. 6451-489   SHEET 3   REV. D

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3N	10" IPS X STD THK PIPE STL	PIPE DETAIL 6451-490	PS	
		2						
		3						
		4.						
		5						
		6						
		7						
		8		HGR No				
C		9	1	H-12	10" SWING HGR (W/2 EX LEGS)	S 25-47-466	ST-PS	
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

mc No PS 150

SERVICE - STRIPPING PUMP EXHAUST   GROUP NO. 6451-0104-1225 PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C   DWG NO. 6451-489   SHEET 4   REV. C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2F	8" IPS X STD THK PIPE STL	PIPE DETAIL 6451-490	PS	
✓		2	1	P2G	↓	↓	↓	
✓	ASSY #1	3	1	P2H	↓	↓	↓	
✓		4.	1	P2K	↓	↓	↓	
✓		5	1	P3L	10" IPS ↓	↓	↓	
		6						
		7	1	V259	5" GATE 150# FLG STL	PO ㉔ 6451-M3	MD-PS	
	ASSY #1	8	1	V260	5" BACK PRESS REG 150# STL (SET AT 8PSIG)	ON PIPE DET 6451-490	PS	
		9	1	V261	5" GATE 150# FLG STL	↓	↓	
		10	1	V262	5" ↓	↓	↓	
		11	1	V263	5" GLOBE STOP 150# FLG STL	↓	↓	
		12	1	V264	8" GATE 150# FLG STL MOTOR OPER	↓	↓	
		13	1	V265	8" ↓	↓	↓	
D		14	1	V318	½" GLOBE STP STL SW 600#	S 26-09-275	ST-PS	
		15	4	80WSI	8" BACKING RING STL (STD)	97-18-137	ST-PS	
		16	1	100WSI	10" ↓	25-20-962	↓	
		17	1	F-1	OIL SEPERATOR (5"-150# FLG)	PO ① 6451-C4	MD-PS	
		18						

REMARKS –

mc No PS 152

SERVICE - STRIPPING PUMP EXHAUST   GROUP NO. 6451-0105-1223 PI SHT 1 OF 3
APPLICABLE HULLS 613C 614C   DWG NO. 6451-489   SHEET 5   REV. D

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	HGR No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C	✓	1	1	RH-1	8" ROD HGR	MO 283176 S33L1	B10-PS	
C	✓	2	1	H-57	8" SWING HGR	MO 283176 S33L13	↓	
D		3	1	H-12	10" 5" SWING HGR	S 25-47-426	ST-PS	
C		4	1	H-12	5" SWING HGR W/2 EX LEGS	S 25-47426	↓	
C	✓	5	1	SH-1	5" SPRING HGR	PO (92) 6552-C16	MD-PS	
D	✓	6	1	H-12 H-14	10" SWING HGR (W/2 EX LEGS)	S 25-49-466	ST-PS	
		7						
		8						
		9						
D		10	12"	P4	½"x"X" HVY STL PIPE	S 57-07-102	ST-PS	
D		11	10'-0"	P5	¼" ↓	S 57-07-100	↓	
D		12	1	F-4	½"x¼" INS RED SW	PO ㊶ 6200-M12	↓	
D		13	1	F-5	¼" UNION MI THD	S 25-12-160	↓	
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE - STRIPPING PUMP EXHAUST   GROUP NO. 6451-0105-1223 PI SH 2 OF 3
APPLICABLE HULLS 613C 614C   DWG NO. 6451-489   SHEET 5A   REV. D

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	16			BOLTS	¾" HVY HEX HEAD L=3"	6000-C7 ㉒	MD-PS	
	2	16	5021	5"	NUTS	¾" HVY HEX	6000-C11 ③	↓	
	3	2			GSKT	1/16" COMPRESSED ASBESTOS (150#)	15-01-280 E	ST-PS	
	4				BOLTS				
	5		○		NUTS				
	6				GSKT				
	7				BOLTS				
	8		○		NUTS				
	9				GSKT				
	10				BOLTS				
	11		○		NUTS				
	12				GSKT				
	13				BOLTS				
	14		○		NUTS				
	15				GSKT				
	16				BOLTS				
	17		○		NUTS				
	18				GSKT				
	19				BOLTS				
	20		○		NUTS				
	21				GSKT				
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

REMARKS –

mc No PS 152

SERVICE - STRIPPING PUMP EXHAUST   GROUP NO. 6451-0105-1223 PI SHT 3 OF 3
APPLICABLE HULLS 613C 614C   DWG NO. 6451-489   SHEET 6   REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	✓	1	1	P1A	5" IPS X STD THK PIPE STL	PIPE DETAIL 6451-490	PS	
	✓	2	1	P1B	↓	↓	↓	
		3	1	P1C	↓	↓	↓	
		4.	1	P1E	↓	↓	↓	
B		5	1	P1D	↓	↓	↓	
		6						
		7	1	V-227	½" SENTINEL RELIEF 250# BRZ SCRD (SET AT 50PSIG)	PO ⑫ 6450-M7	MD-PS	
		8						
		9						
		10	5	50WSI	5" BACKING RING STL (STD)	97-18-133	ST-PS	
D		11	2	H-12	5" SWING HGR W/2 EX LEGS	S 25-47-426	↓	
D		12	~~1~~	~~SH-3~~	~~5" SPRING HANGER~~	~~PO (94) 6552 C16~~	~~MD-PS~~	
D		13	5 2	H-12	5" SWING HANGER (W/EX LEG)	S 25-47-426	ST-PS	
D		14	~~1~~	~~TR-1~~	~~5" TIEROD HGR~~	~~MO 283176 S33L4~~	~~B10-PS~~	
C		15	30"	F-3	3"x3"x½" STEEL	S 73-05-250	PS	
D	✓	16	2	H-13	5" SWING HGR	S 25-48-426	ST-PS	
D	✓	17	1	H-14	5" SWING HGR W/2 EX LEGS	S 25-49-426	↓	
D		18	1	H-14	5" SWING HGR	↓	↓	

REMARKS –

mc No PS 165

SERVICE - STRIPPING PUMP EXHAUST   GROUP NO. 6451-0112-1224 SI SHT 1 OF 2
APPLICABLE HULLS 613C 614C   DWG NO. 6451-489   SHEET 7   REV. D

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	8			BOLTS	¾" HVY HEX HEAD L=3"	6000-C7 ㉒	MD-PS	
	2	8	5021	5"	NUTS	¾" HVY HEX	6000-C11 ③	↓	
	3	1			GSKT	1/16" COMPRESSED ASBESTOS (150#)	15-01-280 E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11		○		NUTS				
	12				GSKT				
	13				BOLTS				
	14		○		NUTS				
	15				GSKT				
	16				BOLTS				
	17		○		NUTS				
	18				GSKT				
	19				BOLTS				
	20		○		NUTS				
	21				GSKT				
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

REMARKS –

mc No PS 165

SERVICE - STRIPPING PUMP EXHAUST   GROUP NO. 6451-0112-1224 SI SHT 2 OF 2
APPLICABLE HULLS 613C 614C   DWG NO. 6451-489   SHEET 8   REV. A

6451-489

MICRO-MASTER® 105 mm
K+E
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ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80
FRAME 8X

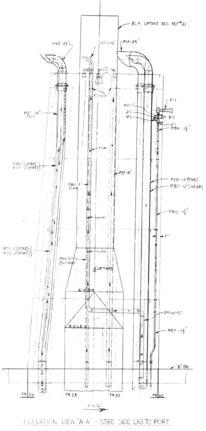
REVISIONS						
REV	ZONE	DESCRIPTION	N N S & D D CO DATE	N N S & D D CO AUTHD	OWNER DATE	OWNER APPD
A	ALL	INITIAL ISSUE	2/2/7		—	—
B	—	SPECIAL HANGERS ADDED	6/20/7		–	–
C	—	ADDED: 5" GLAND LEAKOFF VENT PIPING (P9U, P9V & P9W) DELETED: FWD DECK DRAINS (P7H, P7J, P7K & P7L)	10/3/7		–	–
D	—	ADDED AIR WHISTLE SOLENOID VALVE. WORK ACCOMPLISHED ON CUS 8	7/30/		–	—

AUTHORITY:

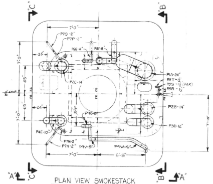
GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCES 1-8.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REFERENCE 1,3,5,&7 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. AND REFERENCE 9.
4. BACKING RINGS AND COUPLINGS SHOWN IN LIST OF MAT'L ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMP AND ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REFERENCE 12.
8. TESTS ARE TO BE IN ACCORDANCE WITH REFERENCE 1,3,5,&7.
9. FOR ARR OF LADDERS & GRATING SEE REF # 20.
10. INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REFERENCE 11.
11. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
12. ALL PIPING ON THIS DRAWING IS CLASS II EXCEPT AIR TO WHISTLE IS CLASS I.
13. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOW: BUTT WELDS TYPE P-2A SOCKET WELDS TYPE P-14, AND FLANGE WELDS TYPE P-16A ON REFERENCE 9 EXCEPT AS OTHERWISE INDICATED.
14. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
15. ALL HOLECUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.

REVISION APPLICABILITY			
REV	N.N. HULL NO. 613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	NO



ELEVATION VIEW "A-A" - STBD SIDE LKG TO PORT



PLAN VIEW SMOKESTACK

TOP 175'-10" DN TO "D" DK (ABT 135'-0")

FWD

FOR LIST OF MATERIAL SEE DWG 6451-500

NN S & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

NO.	REFERENCES	DWG NO.
22	PP/ARR TURBINE GLAND LEAKOFF SYS	6460-700
21	UPTAKES 106'-0" LVL & ABV - ARR	6900-74
20	ARR FLOOR PLTS, GRTG & LADDERS 78'-4" FLAT & ABV	6650-298
19	PP ARR PLUMBING & SEWAGE SYS E.R. ABV 60'-0" FLAT	2500-2277
18	ARR OF EMER DIESEL GEN ROOM - PLAN, SECT, ELEV	4002-59
17	PP ARR SHIPS SERVICE AIR SYS E.R. ABV 60'-0" FLAT - P,S,E	6454-556
16	PP ARR WEATHER DECK DRAINS IN E.R. - PLAN, SECT, ELEV	2500-2341
15	PP ARR SS DIESEL GEN SYS - PLAN, SECT, ELEV	4002-62
14	PP ARR RELIEF VLV ESCAPE SYS E.R. - PLAN, SECT, ELEV	6451-494
13	PP ARR BOILER SAFETY V. ESCAPE SYS E.R. - P,S,E	6451-468
12	PAINTING SCHEDULE	8300-40
11	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
10	STD PIPE HANGERS & INSTALLATION INSTR	257056
9	FABRICATION & WELDING INSTRUCTIONS - CL I & II PIPING	257035
8	↑ - ARR	6454-535
7	DIAG COMPRESSED AIR SYSTEM - LIST	6454-536
6	↑ - ARR	2500-2257
5	DIAG WEATHER DK DRAINS - LIST	2500-2258
4	↑ - ARR	2500-2259
3	DIAG PLUMBING SOIL DRAINS & VENTS - LIST	2500-2260
2	↑ - ARR	6451-471
1	DIAG AUX EXHAUST, L.P. BLD ST, & RELIEF V. ESC - LIST	6451-472

APPROVALS	
OWNERS	ABS NOT REQ'D
	USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

SCALE 3/8" = 1 FT
DRAWN E.R. SMOOT
CHECKED T.E. SEAMAN
SECT MGR J.R. Johnson
DATE COMPL. 2-2-77
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 2-2-77
TECH APPROVAL NOT REQ'D
CSD APPROVAL ETS for R.L. HARRINGTON

ARR PIPING IN OUTER SMOKESTACK
PLAN, SECT, ELEV

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO.

DWG NO. 6451-499 REV D SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 8-30-8 SIGNED J.R. Johnson

GROUP: MC NO.

6451-499

MICRO-MASTER® 105 mm
K+E
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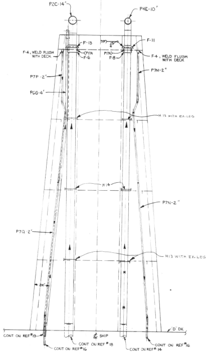
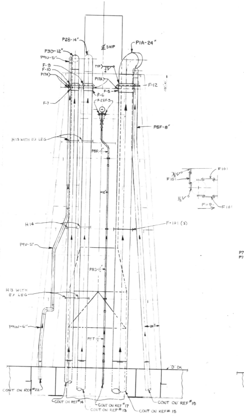
ALEXANDRIA • RICHMOND • NORFOLK
Registered trademark of KEUFFEL & ESSER CO.

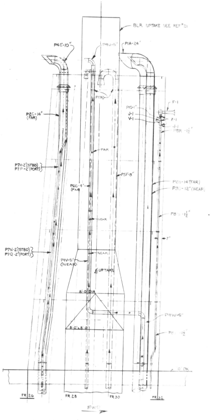
SEPT. '80
FRAME 1
10X


P2C-14"
P4E-10"
F-13
TYP
F-11
F-4, WELD FLUSH WITH DECK
P17A
F-6
P17A
F-8
F-4, WELD FLUSH WITH DECK
P7P-2"
P7M-2"
P6G-4"
H13 WITH EX. LEG
H14
P7N-2"
P7Q-2"
H13 WITH EX. LEG
24"
"D" DK
CONT ON REF #19
CONT ON REF #16
℄ SHIP
CONT ON REF #18
CONT ON REF #14
CONT ON REF #16

SECTION VIEW "C-C" LKG FWD TO FR 29


P2B-14"
℄ SHIP
P1A-24"
P3D-12"
P9U-5"
F-9
F-10
P17A
TYP
P17A
F-12
F-5
F-6
F-7
F-2 & F-3
P5F-8"
H13 WITH EX LEG
P8R-1½"
F101
F101
F101
FWD.
12"
H14
F-101 (3)
P9V-5"
P8S-1½"
H13 WITH EX LEG
P9W-6"
P8T-1½"
24"
"D" DK
CONT ON REF #22
CONT ON REF #14
CONT ON REF #17
CONT ON REF #13
CONT ON REF #15
CONT ON REF #19

SECTION VIEW "B-B" LKG AFT TO FR 29


BLR UPTAKE SEE REF #21
P4E-10"
P9U-5"
P1A-24"
P17A
P2C-14" (FAR)
P10-1"
J-1
V-1
F-1
Z-1
J-1
P8R-1½"
FAR
P7M-2"(STBD)
P7P-2"(PORT)
P5F-8"
P6G-4" (FAR)
P2B-14"(FAR)
P3D-12"(NEAR)
NEAR
P8S-1½"
7"
P7N-2"(STBD)
P7Q-2"(PORT)
NEAR
P9V-5" (NEAR)
℄ UPTAKE
8'-0" DIA
P9W-5"
8'-0" x 8'-0"
P8T-1½"
"D" DK
FR 26
FR 28
FR 30
FR 32
FWD

ELEVATION VIEW "A-A" - STBD SIDE LKG TO PORT

6451-499

MICRO-MASTER 105 mm
K+E
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SEPT. '80
FRAME 2
10X

6451-500 CSD VAULT
E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 8-30-8
SIGNED

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS										
REV.	D	D	B	D	D	B	A	A	A	C
SHEET	1	2	3	4	5	6	7	8	9	10

GROUP
MC NO.

OPEN REV

NNS&DDCo HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615 614 613	311 310 309	T11-S-116a	

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	NO
E	NO	YES	NO

APPROVALS
OWNERS
ABS NOT REQ'D
USCG NOT REQ'D

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING

INSTALLATION GROUPS: 6451-1601-1010 PI, 6454-1601-1010 PI, 4002-1601-1010 PI, 2500-1601-1010 PI, 2500-1601-1012 PI, 6750-1601-1010 PI, 6450-1601-1002 PI
ARR DWG 6451-499
PIPE DETAIL 6451-501

SCALE NONE =1 Ft.
DRAWN E.R. SMOOT
CHECKED T.E. SEAMAN
SECT. MGR. J. H. Johnson
DATE COMPL. 2-2-77
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 2-2-77
TECH. APPROVAL NOT REQ'D
CSD APPROVAL EES for R.L. HARRINGTON

HULL 613C
TYPE OF DWG. —

TITLE
ARR PIPING IN OUTER SMOKESTACK
LIST OF MATERIAL

DWG. NO. 6451-500 REV E SHEET NO. 1 OF 10

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D.	OWNER DATE	OWNER APPD.
A	—	INITIAL ISSUE	2/2/7		—	—
B	3,6,	HANGERS ADDED	6/20/7		—	—
C	10 8	ADDED DELETED LINES 1,2,3,4 ALTERED QTY OF LINE 13 FROM 4 TO 2 ALTERED QTY OF LINE 16 FROM 16 TO 8.	10/3/7		—	—
D	4 5	ADDED LINES 4,8,&10. INCREASED QTY LINES 1&2 AND ALTERED SOURCE OF MAT'L. INCREASED QTY LINE 3. WORK ACCOMPLISHED ON H-613C.	8/30/8		—	—
E	5	SOURCE OF MATL FOR LINE 2 WAS PO 6000-C11 ① FOR 614C				

NOTES:
1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF# 1-4.

NO.	REFERENCES	DWG. NO.
4	DIAG COMPRESSED AIR SYSTEM - LIST	6454-536
3	DIAG WEATHER DK DRAINS - LIST	2500-2258
2	DIAG PLUMBING SOIL DRAINS & VENTS - LIST	2500-2260
1	DIAG AUX EXHAUST, L.P. BLD ST, & RELIEF V. ESC - LIST	6451-472

HULL NO. 613C, 614C DWG. NO. 6451-500
REV. D SHEET 2 OF —

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P2B	14" IPS x STD THK PIPE STL	PIPE DET 6451-501	PS	
	2	1	P3D	12" IPS			
	3	1	P4E	10"			
	4	2	H13	10" SWING HGR ¼" LINER	S 25-48-466	ST-PS	
	5	1	H14	10" SWING HGR ¼" LINER	S 25-49-466		
	6	2	H13	14" SWING HGR ¼" LINER	S 25-48-486		
	7	1	H14	14" SWING HGR ¼" LINER	S 25-49-486		
	8						
	9		FITTING NO				
	10	1	F-6	GUIDE SLEEVE FOR 14" PIPE	MO 257339 SHT 4 LN 5	ST-PS	
	11	1	F-7	GUIDE SLEEVE FOR 12" PIPE MADE FROM 14" IPS x "X" HVY PIPE STL 9" LONG	S 57-07-122 9" LONG	PS	
	12	1	F-8	GUIDE SLEEVE FOR 10" PIPE	MO 257339 SHT 4 LN 1	ST-PS	
	13	1	F-9	RAIN SHIELD FOR 14" PIPE	SHT-1 LN 9		
	14	1	F-10	12"	SHT-1 LN 8		
	15	1	F-11	10"	SHT-1 LN 10		
	16						
	17	2	H13	12" SWING HGR ¼" LINER	S 25-48-476	ST-PS	
	18	1	H14	12" SWING HGR ¼" LINER	S 25-49-476		

REMARKS -

PS-178
SERVICE - PP IN OUTER SMOKESTACK
GROUP NO. 6451-1601-1010 PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-500 SHEET 3 REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P8R	1½" IPS x STD THK PIPE STL	PIPE DET 6451-501	PS	
	2	1	P8S				
	3	1	P8T				
D	4	12"	P10	1" IPS x STD THK PIPE STL	S/ 57-06-104		
	5						
	6	4	H-2	1½" FIXED HANGER (NO LINER)	S/ 25-41-362	ST-PS	
	7						
D	8	1	V-1	1" SOLENOID AIR VALVE	PO (1-C) 6750-C6	ST-PS	
	9						
D	10	2	J-1	1" FLANGE 150# F.F SLIP-ON	P.O. 608C ① 6450-P20	ST-PS	
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

PS-178
SERVICE - PP IN OUTER SMOKESTACK
GROUP NO. 6454-1601-1010 PI SHT 1 OF 2
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-500 SHEET 4 REV. D

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
D	1	12	Z-1	1"	BOLTS	½" HVY HEX HEAD L=1¾"	PO 6000-C12 ⑰	MD-PS	
D	2	12			NUTS	½" HVY HEX	613C 6000-C11 ① 614C 2600-C79 ①		
D	3	3			GSKT	1/16 COMP ASBESTOS 150#	S/ 15-01-264E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

PS-178
SERVICE - PP IN OUTER SMOKESTACK
GROUP NO. 6454-1601-1010 PI SHT 2 OF 2
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-500 SHEET 5 REV. E

1

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P1A	24" IPS x .486" THK PIPE STL	PIPE DET 6451-501	PS	
	2	1	P2C	14" IPS x STD THK PIPE STL			
	3						
	4	1	H14	14" SWING HGR ¼" LINER	S 25-49-486	ST-PS	
	5	2	H13	14" SWING HGR ¼" LINER	S 25-48-486		
	6	3	F-101	SPECIAL HANGER FOR 24" PIPE	MO 283176 S 30 L 7		
	7						
	8						
	9		FITTING NO				
	10	1	F-5	GUIDE SLEEVE FOR 24" PIPE	MO 257339 SHT 3 LN 16	ST-PS	
	11	1	F-6	GUIDE SLEEVE FOR 14" PIPE	MO 257339 SHT 4 LN 5		
	12	1	F-12	RAIN SHIELD FOR 24" PIPE	SHT-1 LN-7		
	13	1	F-13	14"	SHT-1 LN 9		
	14						
	15						
	16						
	17						
	18						

REMARKS -

PS-178
SERVICE - PP IN OUTER SMOKESTACK
GROUP NO. 4002-1601-1010 PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-500 SHEET 6 REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P5F	8" IPS x STD THK PIPE STL	PIPE DET 6451-501	PS	
	2	1	P6G	4" IPS			
	3						
	4						
	5						
	6	4	H-2	8" FIXED HANGER (NO LINER)	S/ 25-41-442	ST-PS	
	7	4	H-2	4"	S/ 25-41-412		
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

PS-178
SERVICE - PP IN OUTER SMOKESTACK
GROUP NO. 2500-1601-1012 PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-500 SHEET 7 REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
C	~~1~~	~~1~~	~~P7H~~	~~2" IPS x "X" HVY THK PIPE STL~~	PIPE DET 6451-501	PS	
C	~~2~~	~~1~~	~~P7J~~				
C	~~3~~	~~1~~	~~P7K~~				
C	~~4~~	~~1~~	~~P7L~~				
	5	1	P7M				
	6	1	P7N				
	7	1	P7P				
	8	1	P7Q				
	9						
	10						
	11						
	12		FITTING NO				
C	13	2	F-4	2" DECK DRAIN STL BW W/ BRONZE, STRAINER	PO ① 2500-C18	MD-PS	
	14						
	15						
C	16	8	H-2	2" FIXED HANGER (NO LINER)	S/ 25-41-372	ST-PS	
	17						
	18						

REMARKS -

PS-178
SERVICE - PP IN OUTER SMOKESTACK
GROUP NO. 2500-1601-1010 PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-500 SHEET 8 REV. C

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	F-1	ADMIRALTY AIR HORN MODEL A822	P.O. (1a) 613 & 614 (1) H615 6750-C6	MD-PS	
	2	4	F-2	½" BOLT HVY HEX HEAD L=1½"	PO ㉔ 6000-C12		
	3	4	F-3	½" NUT HVY HEX	PO ① 6000-C11		
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

PS-178
SERVICE - PP IN OUTER SMOKESTACK
GROUP NO. 6750-1601-1010 PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-500 SHEET 9 REV. A

6451-500
MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.
SEPT. '80
FRAME
8X

6451-500

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P9U	5" IPSxSTD THK PIPE STL	PIPE DET 6451-501	PS	
		2	1	P9V	5" ↓ ↓ ↓ ↓	↓	↓	
		3	1	P9W	5"			
		4						
		5	3	F-14	5" BACKING RING STD STL	S 97-18-133	ST-PS	
		6						
		7	4	H-2	5" FIXED HGR (NO LINER)	S 25-41-422	ST-PS	
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

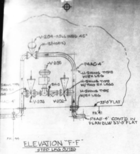
REMARKS –

SERVICE – PP IN OUTER SMOKESTACK

GROUP NO. 6450-1601-1002 PI
SH 1 OF 1

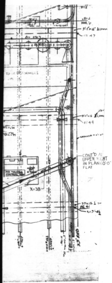
APPLICABLE HULLS: 613C | 614C | 615C

DWG NO. 6451-500
SHEET 10
REV. C

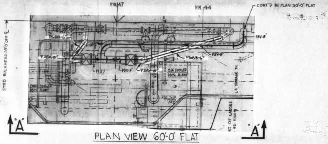


V-204 - ROLLING 45°
V-205
P4AC-4"
H-SWING TYPE W/EX LEG
H-SWING TYPE W/TWO EX LEGS
H-SWING TYPE W/EX LEG
V-203
V-202
33'-0" FLAT
FR 41
P4AB-4" CONT'D IN PLAN BLW 33'-0" FLAT

ELEVATION "F-F"
STBD LKG OUTBD

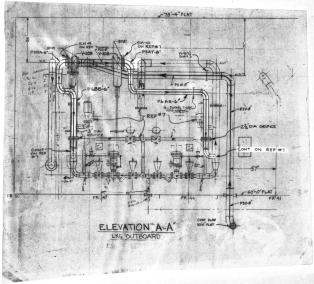


FR 47
FR 44
CONT'D AT UPPER RIGHT IN PLAN 60'-0" FLAT
X=38



FR 47
FR 44
CONT'D IN PLAN 30'-0" FLAT
STBD BULKHEAD 33'-0" OFF ℄
P3V-8"
P6AB-6"
P3BA-8"
P3AV-8"
S.W. COOLED DSTL PLANT
CHW COOLED DSTL PLANT
H-57
L.O. STORAGE TK
"A"
"A"

PLAN VIEW 60'-0" FLAT
FWD
'X' DIM BELOW 78'-4" FLAT



78'-4" FLAT
SH-9 ON REF #7
SH-10 ON REF #7
P3BA-8"
V-209
V-208
P3AV-8"
H-57
P6BB-6"
P6AB-6"
H-SWING TYPE HORIZONTAL
REF #7
P3V-8"
3" DIA ORIFICE
2½" DIA ORIFICE
CONT ON REF #7
CONT ON REF #7
57"
FR 50
FR 47
FR 44
FR 41
60'-0" FLAT
P3V-8"
CONT PLAN 33'-0" FLAT

ELEVATION "A-A"
LKG OUTBOARD

1

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHO	OWNER DATE	OWNER APPD
REVISIONS						
A	—	INITIAL ISSUE	5/14/76	JWG	—	—
B	-	DESIGN DEVELOPMENT: ADDED: REFS 11 & 12, PIPES P4AD-4", P4AE-4", P4AF-4" AND LOW POINT DRAINS. ALTERED: PIPES P4AA-4", P4AB-4" & P4AC-4" RBW/TPS				
	-	LOC OF V206 (21") AFT FR 47 WAS 18"				
	ALL	PIPE HANGERS ADDED TO SUIT E.T. COMMENTS.				
	1A 1B	ADDED REF# 13 & 14. ADDED NOTE# 16.				
	-	PLAN 33'-0" FLAT & SECT "C-C" ADDED ¾" DRAIN TO PIC-14" & P3L-8" TPS	6/2/7	JWG	—	-
C	—	ALT'D GAGE NUMBERS & INFO ON P4Z-4". ADDED REF# 15.			—	—
		ADDED SKETCH NOS. WHERE REF #10 IS USED	4/18/8	JWG		
D	-	ADDED SENTINEL VALVES V-231 & V-232. WORK ACCOMPLISHED ON 613C. EB	10/9/8	JWG	—	—
E	-	IN PLAN VIEW 60'-0" FLAT & ELEV A-A ADDED PIPE DETAILS P3BA-8", P3AV-8", P6BB-6" & P6AB-6" (WORK ACCOM ON 613C ON LIAISON 613-C-JHS-23) GER				
		IN PLAN VIEW 33'-0" LVL ALT'D RUN OF P3Q-8" GER	11/1/8	JWG	—	-

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCES 1 AND 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REFERENCE 1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. AND REFERENCE 3.
4. BACKING RINGS AND COUPLINGS SHOWN IN LIST OF MAT'L ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMP AND ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REFERENCE 6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REFERENCE 1.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REFERENCE 4.
10. INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REFERENCE 5.
11. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
12. ALL PIPING ON THIS DRAWING IS CLASS E.
13. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS: BUTT WELDS TYPE P3 & FLANGE WELDS TYPE P6A ON REF# 3 EXCEPT AS OTHERWISE INDICATED.
14. ALL HOLE CUTS ARE PROVIDED ON STRUCTURAL DWGS.
15. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
16. Ⓑ PIPE HANGERS (SH, RH & TR) ARE DETAILED ON REF# 13 UNLESS OTHERWISE NOTED.

FOR LIST OF MATERIAL, SEE DWG 6451-503

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

NO.	REFERENCES	DWG NO.
15 Ⓒ	PP ARR TURBINE DRAIN SYS	6555-567
14	PIPING ARR - GLANDSEAL LEAKOFF - PLAN, SECT & ELEV	6450-700
13	PIPE HANGERS - LP STM SYS - E.R.	6451-509
12 Ⓑ	PIPING ARR LP STM DRN SYS ENG RM	6555-466
11	PIPING ARR MN LO. SYS COOLERS TO PROP MACHY	6200-619
10	PIPING ARR MISC INSTRUMENTS IN ENG RM	6755-67
9	LIST OF THERM FURN BY SHIPYARD	6750-482
8	LIST OF PRESS & VAC GAGES FURN BY SHIPYARD	6750-483
7	PIPING ARR - AUX EXH ST SYS - ENG RM - PLAN, SECT, & ELEV	6451-473
6	PAINTING SCHEDULE	8300-40/41
5	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
4	TYPICAL ARRANGEMENT OF GAGE PIPING	6750-481
3	FABRICATION & WELDING INSTRUCTIONS CL I & II PIPING	257035
2	ARR	6451-471
1	DIAGRAM - AUX EXH, L.P. BLEED ST, & R.V. ESCAPE - LIST	6451-472

SCALE ½ INCH = 1 FT
DRAWN Anthony Starkey
CHECKED T.E. Seaman
SECT MGR J. B. Johnson
DATE COMPL 5-14-76
EXAMINED —
AUTHORIZED E E Stephens
DATE
TECH APPROVAL 2/17/76
CSD APPROVAL EFA for R.L. Harrington

PIPING ARR - L.P. BLEED STEAM SYSTEM - ENGINE ROOM PLAN, SECT, & ELEV

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO.
DWG NO. 6451-502
REV E
SHEET NO. 1 OF 1

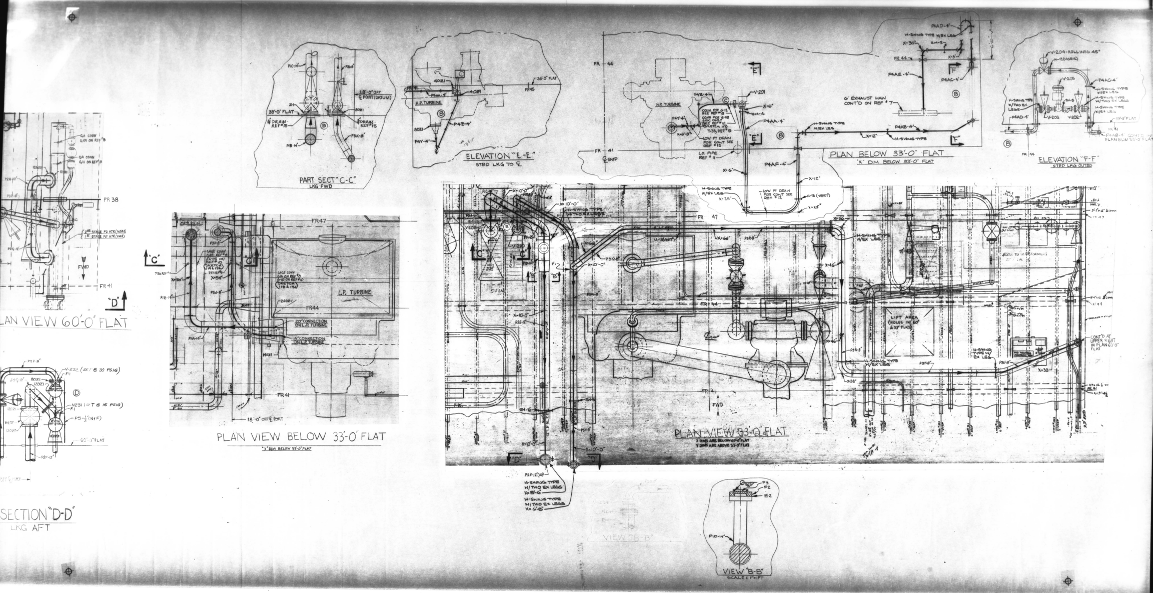
1

GROUP:
MC NO.

6451.502

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

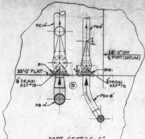
SEPT. '80
FRAME 1
10X


PLAN VIEW 60'-0" FLAT
SECTION "D-D"
LKG AFT
PART SECT "C-C"
LKG FWD
ELEVATION "E-E"
STBD LKG TO ℄
PLAN BELOW 33'-0" FLAT
"X" DIM BELOW 33'-0" FLAT
ELEVATION "F-F"
STBD LKG OUTBD
PLAN VIEW BELOW 33'-0" FLAT
"X" DIM BELOW 33'-0" FLAT
PLAN VIEW 33'-0" FLAT
X DIMS ARE BELOW 60'-0" FLAT
Y DIMS ARE ABOVE 33'-0" FLAT
VIEW "B-B"
VIEW "B-B"
SCALE: 1"=1FT
H.P. TURBINE
L.P. TURBINE
20" CONNECTION ON L.P. TURBINE
18" CONNECTION ON L.P. TURBINE
6" EXHAUST MAIN CONT'D ON REF # 7
LIFT AREA (HOLES IN 60' & 33' FLATS)
CONT'D AT UPPER RIGHT IN PLAN 60'-0" FLAT
H-SWING TYPE W/EX LEGS
H-SWING TYPE W/TWO EX LEGS
LOW PT DRAIN FOR CONT SEE REF # 15
LOW PT DRAIN FOR CONT SEE REF # 12
L.O. PIPE REF # 11
18'-0" OFF ℄ PORT (DATUM)
33'-0" FLAT
FR 38
FR 41
FR 44
FR 45
FR 47
FWD
V-201
V-202
V-203
V-204 - ROLLINED 45°
V-205
V-231 (ST @ 15 PSIG)
V-232 (SET @ 30 PSIG)
P1B-14"
P3K-8"
P4Z-4"
P4Y-4"
P4A-4"
P4AA-4"
P4AB-4"
P4AC-4"
P4AD-4"
P4AE-4"
P4AF-4"
P2F-12"
P1D-14"

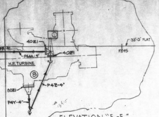
6451.502

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA • ALEXANDRIA • RICHMOND • NORFOLK

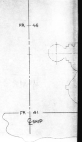
SEPT. '80
FRAME 2
10X

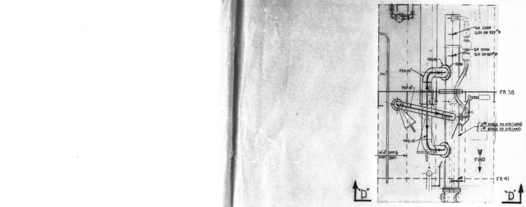

P1C-14"
P3L-8"
18'-0" OFF
℄ PORT (DATUM)
2-1
33'-0" FLAT
8021
3/4" DRAIN-REF #15
3/4" DRAIN-REF #15
P3K-8"
P1B-14"
B

PART SECT "C-C"
LKG FWD

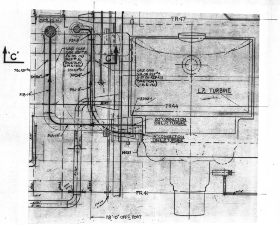

4021
33'-0" FLAT
FR 45
P4M-4"
4021
H.P. TURBINE
B
8021
P4Z-4"
P4Y-4"

ELEVATION "E-E"
STBD LKG TO ℄

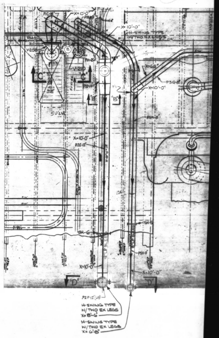

FR 44
FR 41
℄ SHIP

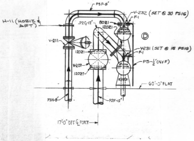

GA CONN G101 ON REF #8
GA CONN G111 ON REF #8
12021
P2H-12"
P3P-8"
FR 38
2ND STAGE FD HTR (NEAR)
1ST STAGE FD HTR (FAR)
P2G-12"
16'-0" OFF ℄ PORT (REF)
FWD
FR 41
"D"
"D"

PLAN VIEW 60'-0" FLAT


FR 47
"C"
"C"
P3K-8"
GAGE CONN G101 ON REF #10 G-111 ON REF #10 (SKETCH 118&136)
X=34"
GAGE CONN G15 ON REF #8 G-110 ON REF #10 (SKETCH 118&136)
P3J-8"
P1B-14"
L.P. TURBINE
FR 44
2002-1
20" CONNECTION ON L.P. TURBINE
14" CONNECTION ON L.P. TURBINE
P1A-14"
14021
FR 41
18'-0" OFF ℄ PORT

PLAN VIEW BELOW 33'-0" FLAT
"X" DIM BELOW 33'-0" FLAT


P1C-14"
X=10'-0"
X=10'-0"
H-SWING TYPE W/TWO EX LEGS
V-208
B
V-210
"C"
"E"
"B"
X=10'-0"
P3Q-8"
X=10'-0"
P2E-12"
SH-6
SH-6
X=10'-0"
"D"
"D"
P2F-12"
H-SWING TYPE W/TWO EX LEGS X=8'-6"
H-SWING TYPE W/TWO EX LEGS X=6'-8"


P3P-8"
V-232 (SET @ 30 PSIG)
F-1
H-11 (HORIZ & AFT)
P2G-12"
8021
12021
D
V-211
12021
V-231 (SET @ 15 PSIG)
F-1
V-207
P5-1/2" (N&F)
12021
60'-0" FLAT
P3N-8"
P2F-12"
17'-0" OFF ℄ PORT

SECTION "D-D"
LKG AFT

6451.502

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 3
10X

6451-503

CSD-VAULT
E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 11-7-8
SIGNED J H Johnson

YARD PRINTS | ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS	REV.	D	D	B	D	D	C	A	A	A	D	A	C
	SHEET	1	2	3	4	5	6	7	8	9	10	11	5A

GROUP
MC NO.

DWG. REV. — HULL APPLIC. NN HULLS ONLY REV.	613	614	615
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	NO
D	YES	YES	NO

NNSB&DDCO HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C 614C 613C	311 310 309	T11-S-116a	

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division
FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING
INSTALLATION GROUP: 6451-0113-1113 SI
6451-0113-1114 PI
6451-0113-1214 PI
6451-0115-1115 PI
6451-0105-1216 SI

ARR DWG 6451-502
PIPE DET 6451-504.
6451-508

SCALE NONE =1 Ft.
DRAWN ANTHONY STARKEY
CHECKED T.E. SEAMAN
SECT. MGR. J H Johnson
DATE COMPL. 5-14-76
EXAMINED
AUTHORIZED E E Stephenson
DATE 5-14-76
TECH. APPROVAL NR
CSD APPROVAL E.E.A. for R.L. HARRINGTON

GROUPED | BY | CHK.
DATES | COMP. | PART
HULL 613C | GROUP NO. | KEY
TYPE OF DWG. —

TITLE PIPING ARR - L.P. BLEED STEAM - ENGINE ROOM - LIST OF MATERIAL

DWG. NO. 6451-503 REV D SHEET NO. 1 OF 11

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE RJP	5/14/76	J H J	—	—
B	3 3 3 4 4 4&5 5A, 10	LINE 12-16 ALT'D: SOURCE WAS 6451-504 17 ADDED P4AD 18 ↓ P4AE 14 ALT'D QTY WAS 4 16 ADDED P4AF RBW/TES GROUP NO CORRECTED WAS 6451-0105-1206 SI ADDED SHT 5A. ADDED L.9 & L.10 TO SHT 10.	6/2/7	JHJ	—	—
C	5A 10 6	ADDED HOT LOADS & VERT MOVE TO L'S 10 THRU 14 ↓ L. 14 ADDED LINES 4, 8, 9, & 12. ERS	10/9/7	JHJ	—	—
D	4 5 10	ADDED LINES 9, 10, & 15. LINE 8 DELETED ADDED LINES 19, 20, & 21 ADDED LINES 4, 5, 8, & 9 GER (WORK ACCOM ON 613C ON LIAISONS 613C-JHJ-23 & 613C-JHJ-24)	11/7/8	JHJ	-	-

NOTES
1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF No 1.

NO.	REFERENCES	DWG. NO.
1	DIAGRAM - AUX EXH, BLEED ST, & RELIEF VLV ESCAPE - LIST	6451-472

HULL NO 613C, 614C & 615C DWG. NO. 6451-503
REV D SHEET 2 OF —

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1A	14" IPS X STD THK PIPE STL	PIPE DETAIL 6451-504	PS	
		2	1	P1B	↓	↓	↓	
		3	1	P1C	↓	↓	↓	
		4	1	P1D	↓	↓	↓	
		5	1	P2E	12" IPS	↓	↓	
		6	1	P2F	↓	↓	↓	
		7	1	P3J	8" IPS	↓	↓	
		8	1	P3K	↓	↓	↓	
		9	1	P3L	↓	↓	↓	
		10	1	P3M	↓	↓	↓	
		11	1	P3N	↓	↓	↓	
B		12	1	P4Y	4" IPS	PIPE DETAIL 6451-508	↓	
B		13	1	P4Z	↓	↓	↓	
B		14	1	P4AA	↓	↓	↓	
B		15	1	P4AB	↓	↓	↓	
B	ASSY	16	1	P4AC	↓	↓	↓	
B		17	1	P4AD	↓	↓	↓	
B		18	1	P4AE	↓	↓	↓	

REMARKS -

SERVICE - L. P. BLEED STEAM
PS-163
GROUP NO. 6451-0105-1216 SI SHT 1 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-503 SHEET 3 REV. B

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V201	4" ANGLE STOP CHK 150# FLG STL (MOTOR OPERATED)	PO ③ 6450-M4	MD-PS	
	ASSY 1	2	1	V202	4" GATE 150# FLG STL	ON PIPE DETAIL 6451-508	PS	
		3	1	V203	4" ↓	↓	↓	
		4	1	V204	4" GLOBE STOP 150# FLG STL	↓	↓	
		5	1	V205	2" REGULATING ↓	↓	↓	
		6	1	V206	10" ANGLE STOP CHK 150# FLG STL (MOTOR OPERATED)	PO ① 6451-C6	MD-PS	
		7	1	V210	8" ANGLE STOP CHK 150# FLG STL (MOTOR OPERATED)	PO ② 6450-M4	↓	
D		8	~~1~~	~~V204~~	~~8" WAFER CHECK CAST IRON~~	~~ON PIPE DETAIL~~ 6451-504	PS	
D		9	1	F1	8" TEE BUTT WELD STL SCH 40	PO (36) 6450-M25	ST-PS	
D		10	1	F2	8" SW FLANGE STL 150#	S/ 25-18-852	↓	
		11	2	140WS1	14" BACKING RING STL (STD)	25-20-976	ST-PS	
		12	2	120WS1	12" ↓	25-20-968	↓	
		13	5	80WS1	8" ↓	97-18-137	↓	
B		14	7	40WS1	4" ↓	97-18-131	↓	
D		15	1	F3	½" STL PLATE 8⅝ DIA	S/ 72-40-265	X10-PS	
B		16	1	P4AF	4" IPS x STD THK PIPE STL	PIPE DETAIL 6451-508	PS	
		17						
		18						

REMARKS -

SERVICE - L.P. BLEED STEAM
PS-163
GROUP NO. 6451-0105-1216 SI SHT 2 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-503 SHEET 4 REV. D

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	20			BOLTS	1⅛ HVY HEX HEAD L=5¼"	6000-C7 (68)	MD-PS	
	2	20	200Z1	20"	NUTS	1⅛ HVY HEX	6000-C11 ⑨	↓	
	3	1			GSKT	1/16 COMPRESSED ASBESTOS 150#	STOCK	ST-PS	
	4	12			BOLTS	⅞ HVY HEX HEAD L=4¼"	6000 C7 (59)	MD-PS	
	5	12	140Z1	14"	NUTS	⅞ HVY HEX	6000-C11 ④	↓	
	6	1			GSKT	1/16 COMPRESSED ASBESTOS 150#	STOCK	ST-PS	
	7	32			BOLTS	1" HVY HEX HEAD L=5¼"	6000-C7 (60)	MD-PS	
	8	32	Z1	10"	NUTS	1" HVY HEX	6000 C11 ⑤	↓	
	9	2			GSKT	1/16 COMPRESSED ASBESTOS 300#	STOCK	ST-PS	
	10	24			BOLTS	¾ HVY HEX HEAD L=3½"	6000-C7 ⑳	MD-PS	
	11	24	80Z1	8"	NUTS	¾ HVY HEX	6000-C11 ③	↓	
	12	3			GSKT	1/16 COMPRESSED ASBESTOS 150#	15-01-284E	ST-PS	
	13	12			BOLTS	⅞ HVY HEX HEAD L=3¾"	6000-C7 ⑮	MD-PS	
	14	12	120Z1	12"	NUTS	⅞ HVY HEX	6000-C11 ④	↓	
	15	1			GSKT	1/16 COMPRESSED ASBESTOS 150#	15-01-290E	ST-PS	
	16	16			BOLTS	⅝ HVY HEX HEAD L=3"	6000-C7 ㉕	MD-PS	
	17	16	40Z1	4"	NUTS	⅝ HVY HEX	6000-C11 ②	↓	
	18	2			GSKT	1/16 COMPRESSED ASBESTOS 150#	15-01-278E	ST-PS	
D	19	8			BOLTS	¾ HVY HEX HD L=3½"	6000-C12 ㉞	ST-PS	
D	20	8	Z2	8"	NUTS	¾ HVY HEX	S/ 21-34-216	↓	
D	21	1			GSKT	1/16 COMP ASBESTOS 150#	15-01-284E	↓	
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - L.P. BLEED STEAM
PS-163
GROUP NO. 6451-0105-1216 SI SHT 3 OF 3
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-503 SHEET 5 REV. D

GROUP

REV.		LINE NO.	QTY (1 SHIP)	HANGER No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	1	H-13	14" SWING TYPE HGR W/TWO EX LEGS	25-48-486	ST-PS	
↓		2	1	H-11	8" SWING TYPE HGR W/TWO EX LEGS	25-46-446	↓	
↓		3	1	H-12	8" SWING TYPE HGR W/TWO EX LEGS	25-47-446	↓	
↓		4	1	H-12	12" SWING TYPE HGR W/TWO EX LEGS	25-47-476	↓	
↓		5	1	H-11	4" SWING TYPE HGR	25-46-416	↓	
↓		6	3	H-11	4" SWING TYPE HGR W/EX LEG	25-46-416	↓	
↓		7	1	H-11	4" SWING TYPE HGR W/TWO EX LEGS	25-46-416	↓	
↓		8	1	H-13	4" SWING TYPE HGR	25-48-416	↓	
↓		9	3	H-12	4" SWING TYPE HGR W/EX LEG	25-47-416	↓	
C		10	1	SH-2	SIZE 4" / HOT LOAD 131 / VERT MOVE COLD-HOT .42" DN	PO (66) 6552-C16	MD-PS	
↓		11	1	3	MATING FLG FOR V205 / 340 / .03" DN	(67)	↓	
↓		12	1	4	4" / 350 / .22" UP	(68)	↓	
↓		13	1	5	8" / 1378 / .29" DN	(69)	↓	
↓		14	1	↓ 6	12" / 2648 / .16 DN	(70)	↓	
B		15	1	RH-1	ROD HGR ASSY ON MATING FLG OF V-206	MO 283096 S.1 L.3	ST-PS	
↓		16	1	↓ 2	ROD HGR ASSY ON MATING FLG OF V-210	MO 283096 S.1 L.8	↓	
		17						
		18						

REMARKS -

SERVICE - L.P. BLEED SYSTEM
PS-163
GROUP NO. 6451-0105-1216 SI SHT 4 OF 4
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-503 SHEET 5A REV. C

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2G	12" IPS X STD THK PIPE STL	PIPE DETAIL 6451-504	PS	
		2	1	P2H	↓	↓	↓	
		3	1	P3P	8" IPS ↓	↓	↓	
C		4	15'-0"	P5	½" IPS x "X"-HVY THK PIPE STEEL	S/ 57-07-102	ST-PS	
		5						
		6	1	V-207	12" GATE 125# FLG CAST IRON	PO ⑤ 6451-M5	MD-PS	
		7	1	V-211	8" ↓	ON PIPE DETAIL 6451-504	PS	
C		8	1	V-231	½" SENTINEL VALVE BRONZE 250# SCR'D	FURN WITH PO 6400-T1	PS	
C		9	1	V-232	↓	↓	↓	
		10	1	120JS1	12" FLANGE SLIP-ON 150# STL	PO ⑤ 6450-C34	MD-PS	
		11						
C		12	2	F-1	½" UNION SCR'D M.I.	S/ 25-12-164	ST-PS	
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - L. P. BLEED STEAM
PS-152
GROUP NO. 6451-0113-1214 PI SHT 1 OF 2
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-503 SHEET 6 REV. C

FLANGED JOINT LIST & INSTALLATION GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	36			BOLTS	⅞ HVY HEX HEAD L=3¾"	6000-C7 ⑮	MD-PS	
	2	36	120Z1	12"	NUTS	⅞ HVY HEX	6000-C11 ④	↓	
	3	3			GSKT	1/16 COMPRESSED ASBESTOS 150#	15-01-290E	ST-PS	
	4	8			BOLTS	¾ ↓ L=3½"	6000-C7 ⑳	MD-PS	
	5	8	80Z1	8"	NUTS	¾ ↓	6000-C11 ③	↓	
	6	1			GSKT	1/16 ↓ 150#	15-01-284E	ST-PS	
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - L.P. BLEED STEAM
PS-152
GROUP NO. 6451-0113-1214 PI SHT 2 OF 2
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-503 SHEET 7 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3Q	8" IPS X STD THK PIPE STL	PIPE DETAIL 6451-504	PS	
		2	1	P3R	↓	↓	↓	
		3						
		4						
		5	1	80WS1	8" BACKING RING STL (STD)	97-18-137	ST-PS	
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - L. P. BLEED STEAM
PS-152
GROUP NO. 6451-0115-1115 PI SHT 1 OF 1
APPLICABLE HULLS 613C 614C 615C
DWG NO. 6451-503 SHEET 8 REV. A

6451-503

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
®Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80
FRAME
8X

6451-503

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

®Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

NN 3569

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3S	8" IPS x STD THK PIPE STL	PIPE DETAIL 6451-504	PS	
		2	1	P3T	↓	↓	↓	
		3	1	P3U	↓	↓	↓	
		4						
		5						
		6	3	80WS1	8" BACKING RING STL (STD)	97-18-137	ST-PS	
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS –

SERVICE – L.P. BLEED STEAM

PS–152

GROUP NO.	6451-0113-1114 PI SHT 1 OF 1								
APPLICABLE HULLS	613C	614C	615C	DWG NO. 6451-503	SHEET 9	REV. A			

NN 3569

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3V	8" IPS x STD THK PIPE STL	PIPE DETAIL 6451-504	PS	
		2	1	P3W	↓	↓	↓	
		3	1	P3X	↓	↓	↓	
D		4	1	P3AY	8" IPS x STD THK PIPE STL	↓		
D		5	1	P3BA	8" ↓	↓		
		6	1	V208 *	8" GATE 125# FLG CAST IRON	PO ④ 6451.MS	MD-PS	
		7	1	V209 *	↓	↓ ④	↓	
D		8	1	P6AZ	6" IPS x STD THK PIPE STL	PIPE DETAIL 6451-504	PS	
D		9	1	P6BB	6" ↓	↓	↓	
		10	3	80WS1	8" BACK RING STL (STD)	97-18-137	ST-PS	
		11						
		12						
		13		HANGER Nº	DESCRIPTION			
C		14	1	SH-1	SIZE 8 · HOT LOAD 871 · VERT MOVE COLD-HOT .22" UP	PO (65) 6552-C16	MD-PS	
B		15	2	H-57	8" SWING HGR	MO 283096 S.1 L.13	ST-PS	
		16						
		17						
		18						

REMARKS – * = V208 & V209 REQUIRE EXT STEMS SEE DWG 257333

SERVICE – L.P. BLEED STEAM

PS–166

GROUP NO.	6451-0113-1113 SI SHT 1 OF 2								
APPLICABLE HULLS	613C	614C	615C	DWG NO. 6451-503	SHEET 10	REV. D			

NN 3568

FLANGED JOINT LIST & INSTALLATION GROUP

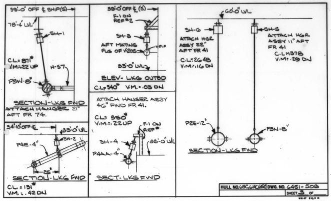
REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	32			BOLTS	3/4" HVY HEX HEAD L=3 1/2"	6000-C7 ⑳	MD-PS	
	2	32	8021	8"	NUTS	3/4" HVY HEX	6000-C11 ③	↓	
	3	4			GSKT	1/16" COMPRESSED ASBESTOS 150#	15-01-284 E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8		○		NUTS				
	9				GSKT				
	10				BOLTS				
	11		○		NUTS				
	12				GSKT				
	13				BOLTS				
	14		○		NUTS				
	15				GSKT				
	16				BOLTS				
	17		○		NUTS				
	18				GSKT				
	19				BOLTS				
	20		○		NUTS				
	21				GSKT				
	22				BOLTS				
	23		○		NUTS				
	24				GSKT				
	25				BOLTS				
	26		○		NUTS				
	27				GSKT				
	28				BOLTS				
	29		○		NUTS				
	30				GSKT				
	31				BOLTS				
	32		○		NUTS				
	33				GSKT				
	34				BOLTS				
	35		○		NUTS				
	36				GSKT				
	37				BOLTS				
	38		○		NUTS				
	39				GSKT				

REMARKS –

SERVICE – L.P. BLEED STEAM

PS–166

GROUP NO.	6451-0113-1113 SI SHT 2 OF 2								
APPLICABLE HULLS	613C	614C	615C	DWG NO. 6451-503	SHEET 11	REV. A			


33'-0" OFF ℄ SHIP(S)
78'-4" LVL
SH-1
C.L.=871#
V.M.=.22 UP
H-57
P3W-8"
SECTION-LKG FWD
ATTACH HANGER 21" AFT FR 74.
33'-0" OFF ℄ (S)
F-1 ON REF#2
SH-3
AFT MATING FLG OF V-205
WELD
33'-0" LVL
ELEV- LKG OUTBD
C.L.=340# V.M.=.03 DN
ATTACH HANGER ASSY 46" FWD FR 41.
C.L.=350#
V.M.=.22 UP
F-1 ON REF#
SH-4
33'-0" LVL
P4AA-4"
SECT-LKG FWD
34'-10" OFF ℄
33'-0" LVL
SH-2
P4E-4"
25"
SECTION-LKG FWD
C.L.=131#
V.M.=.42 DN
60'-0" LVL
SH-6
ATTACH HGR ASSY 22" AFT FR 41
C.L.=2648
V.M.=.16 DN
SH-5
ATTACH HGR ASSY 11" AFT FR 41
C.L.=1378
V.M.=.29 DN
P2E-12"
P3N-8"
SECTION-LKG FWD

HULL NO. 613C, 614C, 615C DWG. NO. 6451-509
SHEET 3 OF

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	AUTH'D	OWNER DATE	APPD.
A	ALL	INITIAL ISSUE	9/23/76	YH	—	—

NOTES:

1. FOR KEY PLAN SHOWING LOCATION OF HANGER IN SHIP, SEE REF# 1.
2. WHERE INDICATED, SUPPORTS, FOUNDATIONS AND REINFORCEMENTS ARE TO BE PROVIDED BY HULL DEPT.
3. HANGERS MAY BE MOVED (6" TO EITHER SIDE OF LOCATION SHOWN.) TO SUIT CONDITIONS ON SHIP EXCEPT THOSE COVERED BY NOTE #2.
4. MATERIAL IS GROUPED ON REF #2.
5. ALL WELDS TO BE 1/4" FILLET.
6. SPRING HANGERS ARE TO BE INSTALLED TO COLD LOAD (C.L.) POSITION, INDICATED IN LBS.
7. VERTICAL MOVEMENT (V.M.) IS FROM COLD TO HOT MEASURED IN INCHES

NO.	REFERENCES	DWG. NO.
2	↑ - LIST	6451-509
1	PIPING ARR- L.P. BLEED STEAM SYSTEM-ER. PLAN, SECTIONS, ELEVATION	6451-502

HULL NO. 613C, 614C, 615C DWG. NO. 6451-509
SHEET 2 OF 4

6451.509

CSD VAULT
E

REPRODUCTION OFFICE
YARD PRINTS yes
REMARKS
GROUPING yes
DATE 9-23-76
SIGNED J H Johnson

YARD PRINTS

ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS				
REV.	A	A	A	A
SHEET	1	2	3	4

NNS&DD Co. HULL No.	NMAD HULL No.	USMA DESIGN
613C	311	711-S-11603
614C	310	
615C	308	

SHIP'S NAME

APPROVALS
OWNERS NR
ABS NR
USCG NR

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
A	YES	YES	YES

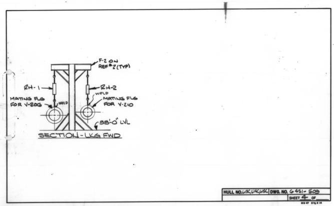
Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689
COMMERCIAL SHIP ENGINEERING

SCALE 1/2" = 1 Ft.
DRAWN W.J. GOLIGHTLY
CHECKED W.J.G.
SECT. MGR. J H Johnson
TECH. APPROVAL NR
DATE COMPL. 9-23-76
EXAMINED
AUTHORIZED E.E. Johnson
DATE 9-23-76
CSD APPROVAL R. L. Harrington

TITLE
PIPE HANGERS- L.P. BLEED STM SYS-ER. FOR ARR DWG 6451-502

DWG. NO. 6451-509
REV A
SHEET NO. 1 OF 4

HULL 613C
KEY GROUP NO. PART COMP. BY CHK.
GROUPED DATES
TYPE OF DWG.


F-2 ON REF#2 (TYP)
RH-1
RH-2
MATING FLG FOR V-206
WELD
MATING FLG FOR V-210
WELD
33'-0" LVL
SECTION-LKG FWD

HULL NO. 613C, 614C, 615C DWG. NO. 6451-509
SHEET 4 OF

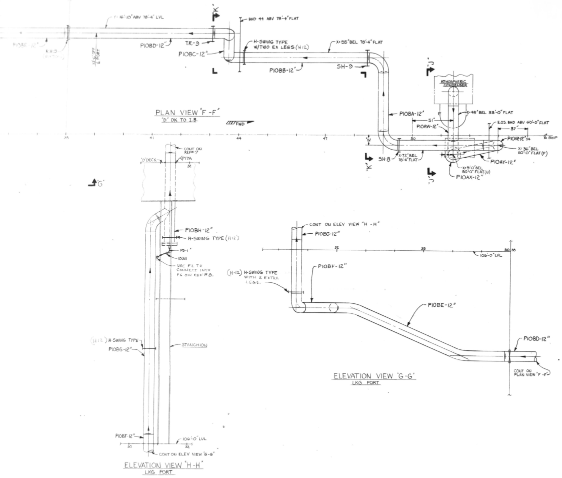
6451-509

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X


Y= 16'-10" ABV 78'-4" LVL
"K"
BHD 44 ABV 78'-4" FLAT
P10BE-12"
R.H.-3
10'-6" OFF ℄ PORT
P10BD-12"
T.R.-9
P10BC-12"
H-SWING TYPE W/TWO EX LEGS (H12)
X=55" BEL 78'-4" FLAT
P10BB-12"
SH-9
"J"
ATMOSPHERIC CONDENSER
P10BA-12"
X=48" BEL 33'-0" FLAT
51"
P10AW-12"
E.O.S. BHD ABV 60'-0" FLAT
37"
FWD
38
41
44
47
50
54
℄ SHIP
P10AZ-12"
X=36" BEL 60'-0" FLAT (F)
12"
SH-8
X=72" BEL 78'-4" FLAT
P10AY-12"
X=9'-0" BEL 60'-0" FLAT (N)
P10AX-12"
"K"
"J"
CONT ON REF#7
'D' DECK
P17A
32
"G"
P10BH-12"
H-SWING TYPE (H12)
P5-1"
10UNI
USE F2 TO CONNECT INTO P6 ON REF #8.
(H12) H-SWING TYPE
P10BG-12"
STANCHION
P10BF-12"
106'-0" LVL
30
32
CONT ON ELEV VIEW "G-G"
CONT ON ELEV VIEW "H-H"
P10BG-12"
32
35
BHD 38
106'-0" LVL
P10BF-12"
(H-12) H-SWING TYPE WITH 2 EXTRA LEGS.
P10BE-12"
P10BD-12"
CONT ON PLAN VIEW "F-F"

PLAN VIEW "F-F"
'D' DK TO I.B.

ELEVATION VIEW "H-H"
LKG PORT

ELEVATION VIEW "G-G"
LKG PORT

REVISIONS						
REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
A	ALL	INITIAL ISSUE	6/9/77	YKY		
B		ALTERED RUN P10BE & P10BF IN ELEV "H-H" CHANGED REF 11 TO REF 7 IN SECT "J-J" IDENTIFIED STAINLESS STL EXP JOINT. ADDED SPLASH PLATE.	5/17/78	AC YKY		

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN WAS DEVELOPED IN ACCORDANCE WITH REFERENCES 1 AND 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD AND AMERICAN BUREAU OF SHIPPING. SEE REFERENCE 1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS AND SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., A.B.S. AND REFERENCE 3.
4. BACKING RINGS AND COUPLINGS SHOWN IN LIST OF MAT'L ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS AND HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS, PUMP AND ETC.
6. NON-DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REFERENCE 6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REFERENCE 1.
9. GAGE PIPING IS TO BE IN ACCORDANCE WITH REFERENCE 4.
10. INSULATION AND LAGGING IS TO BE IN ACCORDANCE WITH REFERENCE 5.
11. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT; "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
12. ALL PIPING ON THIS DRAWING IS CLASS II
13. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOW: BUTT WELDS TYPE P-3, SOCKET WELDS TYPE P-14, AND FLANGE WELDS TYPE P-16A ON REFERENCE 3 EXCEPT AS OTHERWISE INDICATED.
14. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
15. ALL HOLECUTS ARE PROVIDED ON STRUCTURAL DRAWINGS.

FOR LIST OF MATERIAL
SEE DWG 6451-511

REVISION APPLICABILITY			
REV	N.N. HULL NO. 613C	N.N. HULL NO. 614C	N.N. HULL NO. 615C
A	YES	YES	YES
B	YES	YES	YES

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 5-19-78 SIGNED J.H. Johnson

GROUP: MC NO.

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS		
OWNERS	ABS	NR
	USCG	NR

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

SCALE ____ = 1 FT
DRAWN ER SMOOT
CHECKED JHJ
SECT MGR J.H. Johnson
DATE COMPL. 6-9-77
EXAMINED
AUTHORIZED A. Conley
DATE 6-9-77
TECH APPROVAL 7/15/77
C S D APPROVAL R.L. Harrington

NO.	REFERENCES	DWG NO.
8	PIPING ARR. BLR. SAFETY VALVE ESCAPE	6451-468
7	ARRGT PIPING IN OUTER SMOKE STACK	6451-499
6	PAINTING SCHEDULE	8300-40 ● 8300-41 ▲
5	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
4	TYPICAL ARRANGEMENT OF GAGE PIPING	6750-481
3	FABRICATION & WELDING INSTRUCTIONS-CL I & II PIPING	257035
2	↑ ↑ ↑ ↑ ARR	6451-471
1	DIAGRAM- AUX EXH -LIST	6451-472

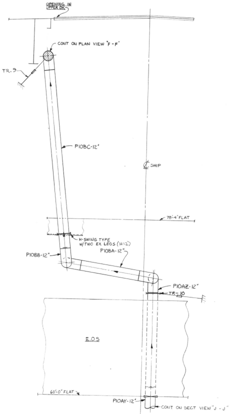
● HULLS 613C & 614C
▲ HULL 615C ONLY

PIPING ARR - ATMOSPHERIC CONDENSER VENT
PLAN, SECTS. & ELEVS.

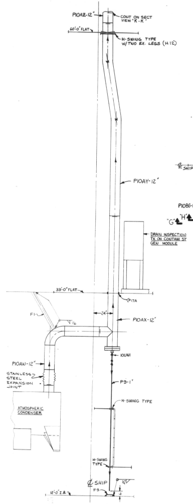
USMA DESIGN T11-S-116a
USMA DWG NO. ~ HULL NO. ~
DWG NO. 6451-510
REV B
SHEET NO. 1 OF 1

6451.510

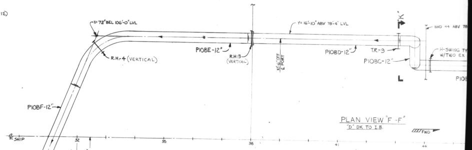
SEPT. '80
FRAME 1
10X


OPENING IN UPPER DK
CONT ON PLAN VIEW "F-F"
TR-9
P10BC-12"
℄ SHIP
78'-4" FLAT
H-SWING TYPE W/TWO EX LEGS (H12)
P10BB-12"
P10BA-12"
P10AZ-12"
TR-10
E.O.S
60'-0" FLAT
P10AY-12"
CONT ON SECT VIEW "J-J"

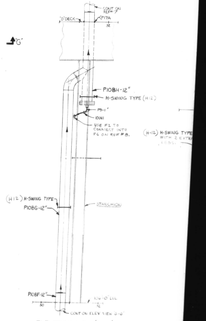
SECTION VIEW "K-K"
LKG FWD


P10AZ-12"
CONT ON SECT VIEW "K-K"
60'-0" FLAT
H-SWING TYPE W/TWO EX. LEGS (H12)
P10AY-12"
DRAIN INSPECTION TK ON CONTAM ST GEN MODULE
33'-0" FLAT
P17A
24"
F1
1/2
P10AX-12"
10UNI
P10AW-12"
STAINLESS STEEL EXPANSION JOINT
P9-1"
H-SWING TYPE
ATMOSPHERIC CONDENSER
H-SWING TYPE
℄ SHIP
F-3
12'-0" I.B.

SECTION VIEW "J-J"
LKG FWD


X=72" BEL 106'-0" LVL
Y=16'-10" ABV 78'-4" LVL
K
BHD 44 ABV 78
P10BE-12"
P10BD-12"
TR-9
H-SWING TY W/TWO EX
R.H.-4 (VERTICAL)
R.H.-3 (VERTICAL)
10'-6" OFF ℄ PORT
P10BC-12"
L
P10B
P10BF-12"
℄ SHIP
32
35
38
41
44
24"
46 1/2"
CONT ON REF #7
P10BG-12"
P10BH-12"
"G"
"H"
STANCHION
FWD

PLAN VIEW "F-F"
"D" DK TO I.B.


CONT ON REF 7
"D" DECK
P17A
32
P10BH-12"
H-SWING TYPE (H12)
P9-1"
10UNI
USE F2 TO CONNECT INTO P6 ON REF #8.
(H-12) H-SWING TYPE WITH 2 EXTRA LEGS
(H12) H-SWING TYPE
P10BG-12"
STANCHION
P10BF-12"
30
106'-0" LVL
32
CONT ON ELEV VIEW G-G

ELEVATION VIEW "H-H"
LKG PORT

6451.510

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.

SEPT. '80
FRAME 2
10X

6451-511 CSD VAULT

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 7-28-78
SIGNED J.H. Johnson

YARD PRINTS | ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS					
REV.	C	C	C	C	C
SHEET	1	2	3	4	5

GROUP
MC NO.

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	NO

615C
614C
613C
NNS&DDCO HULL No. | MARAD HULL No. | USMA DESIGN | SHIP'S NAME

APPROVALS
OWNERS
ABS NR
USCG NR

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division FSCM NO. 43689
DESIGN DIVISION DEPT

FOR ARR GT DWG. 6451-510
PIPE DETS 6451-511

SCALE — =1 Ft.
DRAWN J.H.J.
CHECKED J.H.J.
SECT. MGR. J.H. Johnson
DATE COMPL. 6-9-7
EXAMINED
AUTHORIZED A. Conley
DATE 6-9-77
TECH. APPROVAL NR
CSD APPROVAL R. L. Harrington

GROUPED CHK. BY | DATES COMP. PART | HULL KEY GROUP NO.
TYPE OF DWG. —

TITLE
PIPING ARR. ATMOSPHERIC
CONDENSER VENT
LIST OF MATL.

DWG. NO. 6451-511 REV C SHEET NO. 1 OF 5

MS 8½ X 14

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APPD.
A		INITIAL ISSUE	6/9/7	JHJ		
B	4	ADDED LINE 15	5/17/8	JHJ *		
C	3 4 5	ALT'D QTY LINE 4; WAS 2 ADDED LINE 8 DELETED LINE 10. ALT'D QTY LINE 2, WAS 6 GER	7/28/78	JHJ/B *		

NO. | REFERENCES | DWG. NO.

HULL NO. 613C, 614C, 615C
DWG. NO. 6451-511
SHEET 2 OF

MS46 8½ X 14

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P10BG	12" STD. IPS STEEL PIPE	PIPE DET 6451-512	PS	
		2	1	P10BH	↓	↓	↓	
		3	10 FT		1" STD. I.P.S. STL. PIPE	S 57-06-104	↓	
C		4	3	H12	12" SWING TYPE HANGER	S 25-47-476	ST-PS	
		5						
		6	1	F2	1" TEE, STL. S.W.	S 25-60-079	ST-PS	
		7						
C		8	1	P10BF	12" STD IPS STL PIPE	PIPE DET 6451-512	PS	
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

GROUP NO. PS-181 6451-1601-1003 PI

APPLICABLE HULLS 613C 614C 615C

DWG. NO. 6451-511 SHEET 3 REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P10AW	12" STD. IPS. STEEL PIPE	PIPE DET 6451-512	PS	
		2	1	P10AX	↓	↓	↓	
		3	1	P10AY				
		4	1	P10AZ				
		5	1	P10BA				
		6	1	P10BB				
		7	1	P10BC				
		8	1	P10BD				
		9	1	P10BE				
C		10	~~1~~	~~P10BF~~				
		11						
		12	18 FT	P9	1" STD. IPS. STEEL PIPE	S 57-06-104	PS	
		13						
B		14	1	F-3	6"X6"X3/8" THK SPLASH PLATE STL	MO 216707 SH.9 L18	ST-RS	
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

GROUP NO. PS-176 6451-0115-1001 SI

APPLICABLE HULLS 613C 614C 615C

DWG. NO. 6451-511 SHEET 4 REV. C

GROUP

REV.		LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	TR-10	TIE ROD FOR 12" PIPE	MO 283176 SH-3 L1	ST-PS	
C		2	4	H12	12" SWING TYPE HANGER	S 25-47-476	↓	
		3	1	SH-8	12" SPRING HANGER 1500# HOT LOAD	PO 6552-C16 (71)	MD-PS	
		4	1	SH-9	12" SPRING HANGER 600# HOT LOAD	↓ (72)	↓	
		5	1	TR-9	TIE ROD FOR 12" PIPE	MO 283176 SH-3 L1	ST-PS	
		6	1	RH-3	ROD HANGER FOR 12" PIPE	↓	↓	
		7	1	RH-4	↓			
		8	1	F1	3" STD. IPS. STL PIPE 65" LONG (USE FOR PIPE SUPPORT)	S 57-04-110	PS	
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE -

GROUP NO. PS-176 6451-0115-1001 SI

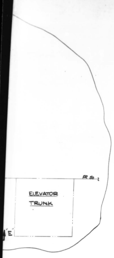
APPLICABLE HULLS 613C 614C 615C

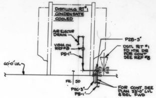
DWG. NO. 6451-511 SHEET 5 REV. C

6451-511

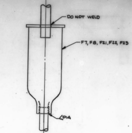
MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80
FRAME
8X

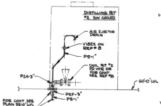

ELEVATOR TRUNK
FR 50
E


DISTILLING PLT #1 CONDENSATE COOLED
AIR EJECTOR DRAIN
V1844 ON REF#8
P5-1"
P2B-3"
DSTL PLT #1 FD HTR DR FOR CONT SEE REF #8
60'-0" LVL
FR 50
P2C-3"
P5-1"
FOR CONT SEE PLAN 33'-0" LVL & BEL FWD

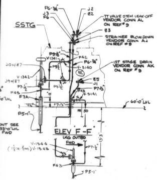
ELEV D-D
LKG OUTBD


DO NOT WELD
F7, F8, F21, F22, F23
P14

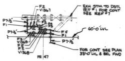
TYP SK "A-1"
SHOWING PIPE ATTACHING TO FUNNEL
N. T. S.


DISTILLING PLT #2 SW COOLED
AIR EJECTOR DRAIN
V1822 ON REF #8
P5-1"
DSTL PLT #2 FD HTR DR FOR CONT SEE REF #8
P2A-3"
60'-0" LVL
P2F-3"
P5-1"
FOR CONT SEE PLAN 33'-0" LVL & BEL FWD

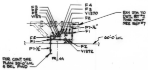
SECT "C-C"


SSTG
P6-3/4"
J3
F6
J2
E2
TT VALVE STEM LEAK-OFF VENDOR CONN AL ON REF #9
E3
STRAINER BLOWDOWN VENDOR CONN AJ ON REF #9
P9-1/2"
V-1341
F42
P6-3/4"
P9-1/2"
V-3140
J10 W/E7
V-1342
J9 W/E7
P7-1/2
F43
F7A
P9-1/2
1ST STAGE DRAIN VENDOR CONN AK ON REF #9
E5
J1
P7-1/2"
F43
V-3141
F7-1/2"
60'-0" LVL
FR 50
P5-1"
CONT SEE 33'-0" LVL FWD
13'-3"
FWD
V-1344
(1 1/2 OR 1/2 ...) V-1343
P7-1/2"
F43
P5-1"

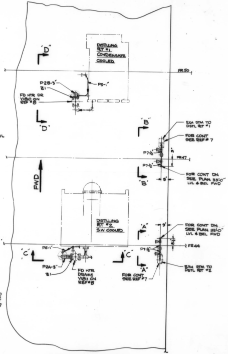
ELEV "F-F"
LKG OUTBD


F2
V1367
EXH STM TO DSTL PLT #1 FOR CONT SEE REF #7
P7-1/2"
F1
F3
F4
F5
P7-1/2"
F5
F1
60'-0" LVL
F3
V1369
F5
F2
V1368
P7-1/2"
FOR CONT SEE PLAN 33'-0" LVL & BEL FWD
FR 47

ELEV "B-B"
LKG OUTBD


F3
F5
F2
V1371
F4
F3
V1370
F2
EXH STM TO DSTL PLT #2 FOR CONT SEE REF #7
P7-1/2"
F1
60'-0" LVL
F5
F1
P7-1/2"
F2
V1372
FOR CONT SEE PLAN 33'-0" LVL & BEL FWD
FR 44

ELEV "A-A"
LKG OUTBD


"D"
DISTILLING PLT #1 CONDENSATE COOLED
FR 50
P2B-3"
E1
P5-1"
FD HTR DR V1810 ON REF #8
"D"
"B"
EXH STM TO DSTL PLT #1
FOR CONT SEE REF #7
P7-1/2"
9"
FR47
P7-1/2"
FOR CONT DN SEE PLAN 33'-0" LVL & BEL FWD
"B"
FWD
DISTILLING PLT #2 S.W COOLED
"A"
9"
FOR CONT DN SEE PLAN 33'-0" LVL & BEL FWD
8 1/2"
FR44
P7-1/2"
"C"
P5-1"
"C"
P2A-3"
E1
FD HTR DRAINS V1811 ON REF #8
FOR CONT SEE REF #7
"A"
EXH STM TO DSTL PLT #2

PART. PLAN 60'-0" LVL
FWD - STBD

REVISIONS			NN S&DD CO DATE	NN S&DD CO AUTH	OWNER DATE	OWNER APPD
REV	ZONE	DESCRIPTION				
A	ALL	INITIAL ISSUE	3/25/77		–	–
B	–	ALTD FUNNEL IN VIEW "F-F"	8/11/77		–	–
C	–	ALTD V-1342 & V-1344 SSTG DRN VALVES WERE SOLENOID SOCKET WELD VALVES	4/7/78		–	–
D	–	PLAN VIEW 33'-0" LVL & BEL FWD; ALTD P17-4" & P14-4". SECT "G-G" ALTD TO SUIT. (WORK ACCOMP ON 613C.) (NO MAT'L CHG)				
		PLAN VIEW "33'-0" LVL & BLW AFT" - CHANGED F-17 TO F4				
	–	PLAN 33'-0" LVL & BEL, ALT'D RUN OF P4AA-1 1/2" TO CLEAR INCLINED LADDER (WORK ACCOMP ON 613C)				
	–	PLAN 78'-4" TO 60'-0" LVL AFT: ALT'D SOOT BLWR DRNS P4 & SKETCH "E-1" ALT'D TO SUIT. ADDED SK'S E-2, E-3 & E-4. (WORK ACCOMP. ON 613C.)	9/12/78		–	–
E		ELEV F-F: ADDED F42, V3140, V3141 & P9-1/2" FOR SSTG STRAINER BLOWDOWN BY-PASS & 1ST STAGE DRAIN BY-PASS. SECT E-E & PLAN 60'-0" LVL FWD - PORT ALT'D TO SUIT (WORK ACCOM ON 613C BY LIAISON NO. 613C-JHJ-27.)	1/4/79			

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN DEVELOPED IN ACCORDANCE WITH REFERENCES #1 & 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD & AMERICAN BUREAU OF SHIPPING. SEE REF #1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS & SHALL MEET THE REQUIREMENTS OF THE U.S.C.G, ABS & REF #3.
4. COUPLINGS & BACKING RINGS SHOWN IN LIST OF MATERIAL ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS & HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS PUMPS ETC.
6. NON DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REF #6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REF #1.
9. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT. "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
10. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS: BUTT WELD P-3, SOCKET WELD P-14 & FLANGE WELD P1A & P16-A ON REF #3, EXCEPT AS OTHERWISE NOTED.
11. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY & MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
12. ALL HOLE CUTS ARE APPROVED ON STRUCT. DWGS.
13. PIPE HANGERS ORDERD ON LIST OF MATERIAL ARE TO BE USED AS REQUIRED & ARE TO BE INSTALLED IN ACCORDANCE WITH REF #4 UNLESS OTHERWISE NOTED.
14. ALL PIPING ON THIS ARRANGEMENT IS CLASS II EXCEPT FOR THE FOLLOWING DRAINS FROM THE SOURCE TO THE LAST CUTOUT VLV, CARGO PUMP THROTTLE VLV ABOVE & BELOW SEAT, 1ST STAGE, BALLAST PUMP THROTTLE VALVE ABOVE & BELOW SEAT; FIRE PUMP THROTTLE VALVE ABOVE & BELOW SEAT, STEAM RING, SSTG STM INLET STRAINER BLOWDOWN & 1ST STAGE; BOILER STEAM TO SOOT BLOWERS, BOILER GAGE GLASS & SUPHTR INLET & OUTLET & MAIN STEAM PIPING WARM-UP SHALL BE CLASS I.

FOR LIST OF MATERIAL, NOTES & REF SEE NN DWG NO. 6555-467

NO.	REFERENCES	DWG NO.
17	PP ARR FEED PUMP DISCH SYS - PLAN	6552-377
16	PP ARR RESERVE & MAKE-UP FD SYS - ER PLAN	6552-388
15	FIREPUMP TURBINE - OUTLINE - TURBODYNE #LE-145871	PO 6350-C7
14	BALLAST PUMP TURBINE - OUTLINE - TURBODYNE #LE-145149	PO 6350-T3
13	CARGO PUMP TURBINE - OUTLINE - TURBODYNE #LE-145024	PO 6350-T4
12	PP ARR BOILER SOOT BLOWER STM - PLAN	6450-706
11	PP ARR MAIN STEAM SYS ER - PLAN	6440-507
10	PP ARR HP STEAM DRAIN SYS ER - PLAN	6555-475
9	TG SET 2150 KW OUTLINE	GE # 501E483RE
8	PP ARR DSTL PLANT SYS ER - PLAN	6557-90
7	PP ARR AUX EXH ST SYS ER - PLAN	6451-473
6	PAINTING SCHEDULE	8300-40
5	DIRECTIONS FOR INSULATING & LAGGING PIPE & AUX	257322
4	STANDARD PIPE HANGERS	257056
3	FABRICATION & WELDING INSTRUCTIONS - CL I & II	257035
2	DIAGRAM DRAIN COLLECTING SYS - PLAN	6555-464
1	DIAGRAM DRAIN COLLECTING SYS - LIST	6555-465

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C 613C	310 309	

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

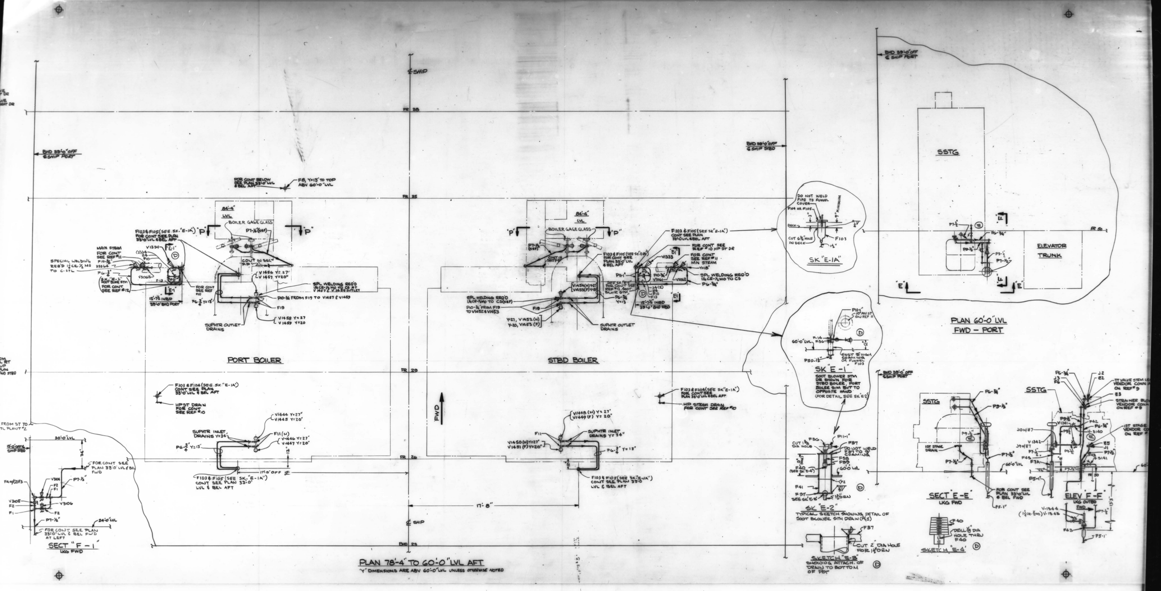
SCALE 1/2" = 1 FT
DRAWN D. L. HOFFMAN
CHECKED R.M. EDGE
SECT MGR J. H. Johnson
DATE COMPL 3-25-77
EXAMINED
AUTHORIZED
DATE 3-25-77
TECH APPROVAL NR
C S D APPROVAL R. K. Harrington

PIPING ARR LOW PRESSURE STEAM DRAIN SYS - ENG RM PLAN, SECT & ELEV

U S M A DESIGN T11-S-116a
U S M A DWG NO.
HULL NO.
DWG NO. 6555-466
REV E
SHEET NO. 1 OF 1

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
DATE 1-15-7
GROUP:
MC NO.

6555-466
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
10X
FRAME 1



PLAN 78'-4" TO 60'-0" LVL AFT
"Y" DIMENSIONS ARE ABV 60'-0" LVL UNLESS OTHERWISE NOTED
PORT BOILER
STBD BOILER
FWD
℄ SHIP
FR 38
FR 35
FR 29
FR 26
BHD 23
BHD 33'-0" OFF ℄ SHIP PORT
BHD 33'-0" OFF ℄ SHIP STBD
17'-8"
84'-4" LVL
BOILER GAGE GLASS
SUPHTR OUTLET DRAINS
SUPHTR INLET DRAINS Y=34"
F8, Y=13' TO TOP ABV 60'-0" LVL
FOR CONT BELOW SEE PLAN 33'-0" LVL & BEL AFT
HP STEAM DRAIN FOR CONT SEE REF #10
SPL WELDING REQ'D 1¼ CR-½ MO TO CS
SK "E-1A"
DO NOT WELD PIPE TO FUNNEL COVER
CUT 6⅝" HOLE IN DECK
F103
SK "E-1"
SOOT BLOWER STM DR SHOWN FOR STBD BOILER, PORT BOILER STM BUT TO OPPOSITE HAND (FOR DETAIL SEE SK "E-2")
SK "E-2"
TYPICAL SKETCH SHOWING DETAIL OF SOOT BLOWER STM DRAIN (P&S)
SKETCH "E-3"
SHOWING ATTACH. OF DRAIN TO BOTTOM OF POT
CUT 2" DIA HOLE FOR 1½" DRN
SKETCH "E-4"
DRILL ⅛" DIA HOLE THRU F40
SSTG
ELEVATOR TRUNK
PLAN 60'-0" LVL FWD - PORT
SECT "E-E"
LKG FWD
ELEV "F-F"
LKG OUTBD
1ST STAGE DRAIN
STRAINER BLOWDOWN VENDOR CONN ON REF #9
SECT "F-1"
LKG FWD
30'-0" LVL
24'-0" LVL
FOR CONT SEE PLAN 33'-0" LVL & BEL FWD AT LEFT

6555-466

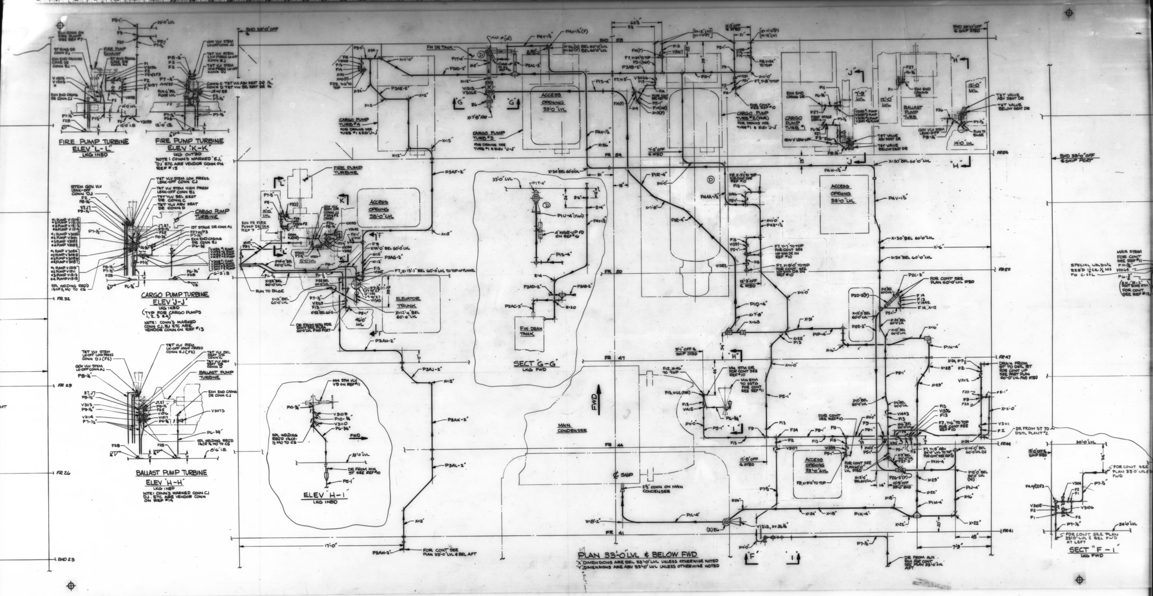
MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

10X

FRAME 2


FIRE PUMP TURBINE
ELEV "L-L"
LKG INBD
FIRE PUMP TURBINE
ELEV "K-K"
LKG OUTBD
NOTE: CONN'S MARKED "EJ", "DJ" ETC ARE VENDOR CONN ON REF #15
CARGO PUMP TURBINE
ELEV "J-J"
LKG INBD
(TYP FOR CARGO PUMPS 1, 2, 3 & 4)
NOTE: CONN'S MARKED CONN CJ, BJ ETC ARE VENDOR CONN ON REF #13
BALLAST PUMP TURBINE
ELEV "H-H"
LKG INBD
NOTE: CONN'S MARKED CONN CJ DJ. ETC ARE VENDOR CONN ON REF #14
ELEV "H-1"
LKG INBD
SECT "G-G"
LKG FWD
FW DRAIN TANK
FIRE PUMP TURBINE
ACCESS OPENING 33'-0" LVL
ELEVATOR TRUNK
CARGO PUMP TURB #4
CARGO PUMP TURB #3
CARGO PUMP TURB #2 (FWD)
CARGO PUMP TURB #1
BALLAST PUMP TURB
MAIN CONDENSER
FWD
℄ SHIP
FR 54
FR 50
FR 47
FR 44
FR 41
FR 32
FR 29
FR 26
BHD 23
BHD 33'-0" OFF ℄ SHIP STBD
BHD 33'-0" OFF ℄ SHIP PORT
PLAN 33'-0" LVL & BELOW FWD
"X" DIMENSIONS ARE BEL 33'-0" LVL UNLESS OTHERWISE NOTED
"Y" DIMENSIONS ARE ABV 33'-0" LVL UNLESS OTHERWISE NOTED
SECT "F-1"
LKG FWD

6555-466

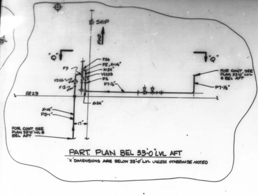
MICRO-MASTER 105 mm

K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

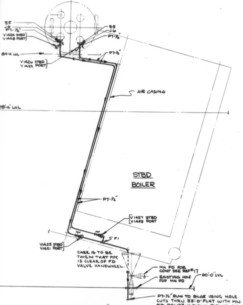
10X

FRAME 3


℄ SHIP
FWD
"Q"
"Q"
F24
F5, X=14"
X=24"
V3103
F2
F9
V3116
F13
P7-½"
FOR CONT SEE PLAN 33'-0" LVL & BEL AFT
P7-½"
FR 29
X=24"
X=14"
P5-1"
17"
FOR CONT SEE PLAN 33'-0" LVL & BEL AFT

PART. PLAN BEL 33'-0" LVL AFT

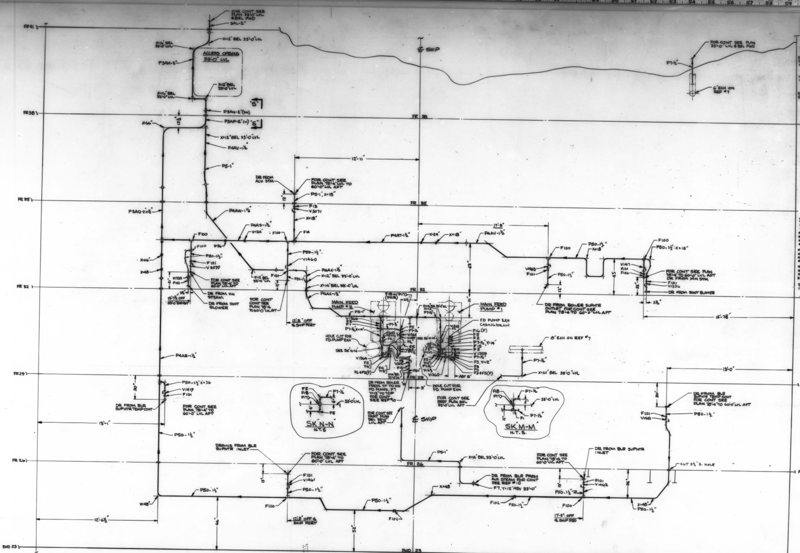
"X" DIMENSIONS ARE BELOW 33'-0" LVL UNLESS OTHERWISE NOTED


E5
J6
P7-½"
V1424 STBD
V1420 PORT
E5
J6
P7-½"
84'-4" LVL
P7-½"
V1426 STBD
V1422 PORT
AIR CASING
78'-4" LVL
STBD BOILER
P7-½"
V1427 STBD
V1423 PORT
F1
V1425 STBD
V1421 PORT
CARE IS TO BE TAKEN THAT PIPE IS CLEAR OF FD VALVE HANDWHEEL.
MN FD FOR CONT SEE REF #17
EXISTING HOLE FOR MN FD
60'-0" LVL
P7-½" RUN TO BILGE USING HOLE CUTS THRU 33'-0" FLAT WITH MN FD RELIEF V. DISCH PIPING AT 11'-0" OF ℄ PORT 6" FWD FR 32 & 11'-0" OFF ℄ STBD 18" AFT FR 32

SECT "P-P"

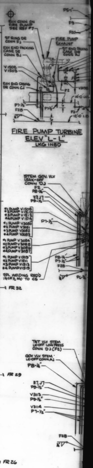
LKG AFT

STBD BOILER SHOWN
PORT BOILER SIMILAR
BUT OPPOSITE HAND


FR 41
FOR CONT SEE PLAN 33'-0" LVL & BEL FWD
3AL-2"
X=12" BEL 33'-0" LVL
X=16" BEL 33'-0" LVL
ACCESS OPENING 33'-0" LVL
P3AM-2"
X=12" BEL 33'-0" LVL
X=16" BEL 33'-0" LVL
"S"
P3AN-2" (DN)
P3AP-2" (N)
"S"
FR 38
X=66"
15½"
X=12" BEL 33'-0" LVL
P4AV-1½"
P5-1"
℄ SHIP
FOR CONT SEE PLAN 33'-0" LVL & BEL FWD
P7-½"
6" EXH ON REF #7
12'-11"
DR FROM AUX STM
FOR CONT SEE PLAN 78'-4" LVL TO 60'-0" LVL AFT
P5-1", X=18"
F13
V3071
X=18"
FR 35
P3AQ-2x1½"
P4AW-1½"
P4AS-1½"
X=24"
F100
F14
P4AT-1½"
X=24"
X=18"
P4AV-1½"
17'-8"
F100
X=36
F100
P50-1½"
F101
V3070
X=66"
X=48
V1335
F101
FOR CONT SEE PLAN 78'-4" TO 60'-0" LVL AFT
DR FROM MN STEAM
DR FROM SOOT BLOWER
15'-7½" OFF
P50-1½"
V1460
P4AX-1½"
X=12" BEL 33'-0" LVL
F101
X=12" BEL 33'-0" LVL
X=14" BEL 33'-0" LVL
P4AX-1½"
FOR CONT SEE PLAN 78'-4 TO 60'-0" LVL AFT
17'-8" OFF ℄ SHIP PORT
FR 32
F18 W/ P17 (FAR)
20½"
MAIN FEED PUMP #2
P5-1"
V1366
F2
F1
P7-½", X=14"
HOLE CUT FOR FD. PUMP EXH
SEE SK "N-N"
V1364
F5 Y=6"
F6 & F5(F)
F4 Y=9"
P7-½"
F5
P7-½"
V1365
F15
X=14" BR 33'-0" LVL
X=12
P7-½"
SEE SK "M-M"
MAIN FEED PUMP #1
FD PUMP EXH CASING DRAIN
F16 (F)
F5
F2
P7-½", Y=14"
F15
F5
V1359
P7-½"
F5, Y=12"
F8
F4
F3 & F5(F)
V1360
ABT 8"
62"
31"
F100
P50-1½"
X=18"
V1463
F101
P50-1½"
45
12"
F100
P50-1½", X=18"
V1417
F101
F106
FOR CONT SEE PLAN 78'-4" TO 60'-0" LVL AFT
DR FROM MN STM
F101
V1336
DR FROM SOOT BLOWER
3⅛"
DR FROM BOILER SUPHTR OUTLET FOR CONT SEE PLAN 78'-4 TO 60'-0" LVL AFT
15'-7⅛"
FR 32
8" EXH ON REF #7
P7-½"
X=61" BEL 33'-0" LVL
13'-0"
FR 29
DR FROM BOILER PRESS. ST TO MN FD PUMPS, F7 Y=12" TO TOP FOR CONT SEE REF #10
9"
HOLE CUT FOR FD. PUMP EXH
FOR CONT SEE PART PLAN BEL 33'-0" LVL AFT
FOR CONT SEE PART PLAN BEL 33'-0" LVL AFT
℄ SHIP
F5
F18
P17
P7-½"
33'-0" LVL
F5
SK "N-N"
N.T.S
F18
P17
P7-½"
33'-0" LVL
F1
P7-½"
SK "M-M"
N.T.S.
P50-1½" X=36
V1419
F101
DR FROM BLR SUPHTR TEMP CONT
FOR CONT SEE PLAN 78'-4" TO 60'-0" LVL AFT
30"
13'-1"
P50-1½"
DR FROM BLR SUPHTR TEMP CONT FOR CONT SEE PLAN 78'-4" TO 60'-0" LVL AFT
F101
V1418
P50-1½"
DRAINS FROM BLR SUPHTR INLET
FOR CONT SEE PLAN 78'-4" TO 60'-0" LVL AFT
FR 26
P5-1"
X=14" BEL 33'-0" LVL
FOR CONT SEE PLAN 78'-4 TO 60'-0" LVL AFT
DR FROM BLR SUPHTR INLET
CUT 2½" D. HOLE
FR 26
F101
V1461
P50-1½"
DR FROM BLR PRESS AUX STEAM FOR CONT SEE REF #10
F7, Y=12" ABV 33'-0"
F101
V1462
P50-1½"
X=48"
P50-1½"
P50-1½"
X=48"
F100
F102
F102
P50-1½"
F100
X=48"
P50-1½"
12'-6½"
66"
17'-8" OFF ℄ SHIP PORT
52"
17'-8" OFF ℄ SHIP STBD
BHD 23
BHD 23
BHD 23

PLAN 33'-0" LVL & BELOW AFT

"X" DIMENSIONS ARE BELOW 60'-0" LVL UNLESS OTHERWISE NOTED
"Y" DIMENSIONS ARE ABV 33'-0" LVL UNLESS OTHERWISE NOTED

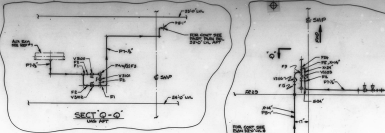

P5-1"
F9
F20
EXH CONN ON FIRE PUMP SEE REF #7
ST RING DR CONN FJ
FIRE PUMP EXHAUST
EXH END PACKING CASE DR CONN BJ
ST END PACKING CASE DR CONN AJ
V1502
V1503
EXH END CASING DR CONN CJ
F2
V3098
14'-0" LVL
P7-½"
P7-½"
F28
F2
12'-0" I.B
STEM GOV. VLV LEAK-OFF CONN DJ
F2
P8-¼"
P7-½"
SPL WELDING REQD
TRT VLV STEM LK-OFF LOW PRESS CONN DJ (F2)
GOV VLV STEM LK-OFF CONN AJ
P8-¼"
P5-½"
V3113
P5-½"
V3114
P7-½"
F28

FIRE PUMP TURBINE ELEV "L-L"

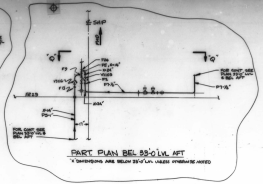
LKG INBD

6555-466

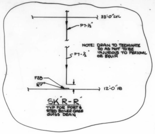
SEPT. '80
10X
FRAME 4


33'-0" LVL
P5-1"
FOR CONT SEE PART. PLAN BEL 33'-0" LVL AFT
AUX EXH SEE REF#7
P7-½"
P7-½"
V3100
F2
F1
F4 W/(2) F3
V3101
F2
℄ SHIP
F2
V3102
F1
24'-0" LVL

SECT "Q-Q"
LKG AFT

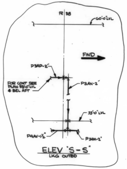

℄ SHIP
FWD
"Q"
"Q"
F24
F5, X=14"
X=24"
V3103
F2
F9
V3116
F13
P7-½"
FOR CONT SEE PLAN 33'-0" LVL & BEL AFT
P7-½"
FR29
X=24"
X=14"
P5-1"
17"
FOR CONT SEE PLAN 33'-0" LVL & BEL AFT

PART. PLAN BEL 33'-0" LVL AFT
"X" DIMENSIONS ARE BELOW 33'-0" LVL UNLESS OTHERWISE NOTED

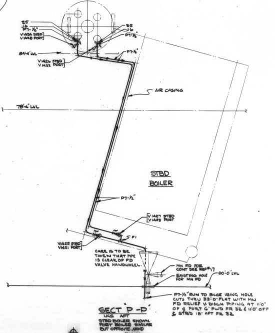

33'-0" LVL
P7-½"
P7-½"
F28
¼"V°
12'-0" IB

NOTE: DRAIN TO TERMINATE SO AS NOT TO BE INJURIOUS TO PERSONAL OR EQUIP.

SK "R-R"
TYP FOR PORT & STBD BOILER GAGE GLASS DRAIN


FR 38
60'-0" LVL
FWD
P3AP-2"
FOR CONT SEE PLAN 33'-0" LVL & BEL AFT
P3AN-2"
33'-0" LVL
P4AV-1½"
P3AM-2"

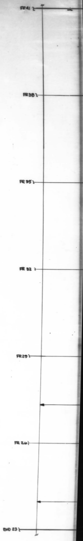
ELEV "S-S"
LKG OUTBD


E5
J6
P7-½"
V1424 STBD
V1420 PORT
E5
J6
P7-½"
84'-4" LVL
P7-½"
V1426 STBD
V1422 PORT
AIR CASING
78'-4" LVL
STBD
BOILER
P7-½"
V1427 STBD
V1423 PORT
F1
V1425 STBD
V1421 PORT
MN FD FOR CONT SEE REF#17
EXISTING HOLE FOR MN FD
60'-0" LVL

CARE IS TO BE TAKEN THAT PIPE IS CLEAR OF FD VALVE HANDWHEEL.

P7-½" RUN TO BILGE USING HOLE CUTS THRU 33'-0" FLAT WITH MN FD RELIEF V. DISCH PIPING AT 11'0" OF ℄ PORT 6" FWD FR 32 & 11'0" OFF ℄ STBD 18" AFT FR 32

SECT "P-P"
LKG AFT
STBD BOILER SHOWN
PORT BOILER SIMILAR
BUT OPPOSITE HAND


FR41
FR38
FR35
FR32
FR29
FR26
BHD 23

6555-466

SEPT. '80
10X
FRAME 5

6555-467

CSD VAULT

E

REPRODUCTION OFFICE	YARD PRINTS YES	REMARKS	GROUPING YES	DATE 1-16-79	SIGNED																					
REV. STATUS OF SHEETS	REV.	E	E	E	E	A	A	A	A	A	A	A	A	A	A	D	A	D	C	A	A	C	C	C	E	A
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

REV.	E	C	A	E	C
SHEET	26	27	28	29	30

REVISIONS — REFER TO SHEET NO. 2

YARD PRINTS | ORDERED BY DESIGN

GROUP

MC NO.

DWG. REV. — HULL APPLIC.		
REV.	613C	614C
A	YES	YES
B	YES	YES
C	YES	YES
D	YES	YES
E	YES	YES

NNS&DDCO. HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C 613C	310 309	T11-S-1160	

APPROVALS

OWNERS | ABS | USCG

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING

FOR ARRANGEMENT DWG SEE: 6555-466
FOR PIPE DETAIL DWG SEE: 6555-468
INSTALLATION GROUP: 6555-0114-1002 PI; 6555-0113-1202 PI; 6555-0106-1002 PI; 6555-0105-1202 PI; 6555-0104-1205 PI; 6555-0115-1006 PI; 6555-0104-1104 PI; 6555-0105-1103-PI; 6555-0113-1107 PI; 6555-0115-1008 SI; 6555-0117-1009 SI

SCALE	NONE	DATE COMPL.	3-25-7
DRAWN	D.L. HOFFMAN	EXAMINED	
CHECKED	H.M. EDGE	AUTHORIZED	E.L. Stephens
SECT. MGR.	J.K. Johnson	DATE	3-25-77
TECH. APPROVAL	NR	CSD APPROVAL	R.L. Warrington

GROUPED: BY / CHK. — DATES: PART / COMP. — HULL 613C — GROUP NO. — KEY

TYPE OF DWG. —

TITLE
PIPING ARR LOW PRESSURE STEAM DRAIN SYS-ENG RM LIST OF MATERIAL

DWG. NO. 6555-467 | REV E | SHEET NO. 1 OF 30

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	AUTH'D	OWNER DATE	APPD.
A	ALL	INITIAL ISSUE	3/25/77	JHJ	—	—
B	18 27 25 18 22 29	ADDED S/M FOR V1344 ADDED S/M FOR V1342 LINE 6 ALTD. ADDED LINES 14,15,16 & 17,13 ADDED LINES 15,16,17 & 18 ADDED LINES 8,9,10 & 11	8/15/7	JHJ		
C	18 22 23 27 29 30 18 21	ALT'D LINE 3 WAS ½ SOLENOID SOCKET WELD 900# VALVE SOURCE WAS PO 6555-C11 ① ADDED LINE 4 ALT'D QTY OF LINE 7,8 & 9 WERE 40, 80 & 10 RESP ALT'D LINE 4 WAS ½ SOLENOID SOCKET WELD 900# VALVE SOURCE WAS PO 6555-C11 ① ADDED LINE 6 & 7 ADDED LINE 16,17 & 18 ALT'D SOURCE OF MAT'L WAS PIPE DET ALT'D S/M FOR LINE 15, WAS 6450-M9 ②	4/7/8	JHJ	—	—
D	15&16 25 26 17	SHT 15: ADDED LINES 15&16. (WORK ACCOMP ON 613C.) SHT 25; DELETED LINE NO. 7, ADDED LINE NO. 18. SHT 26; ADDED LINES NO. 5 THRU 11. (WORK ACCOMP ON 613C.) S/M ALTD FOR LINE 13	9/21/8	JHJ	—	—
E	24 26 29 3,4	QTY OF L'S 5&6 WAS 90'-0" & 72" RESPECT. ADDED L'S 12-13. ADDED L'S 12-13. (WORK ACCOMP ON 613C BY LIAISON NO. 613C-343-27) MAT'L ADDED	1/15/9	JHJ	—	—

NOTES

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF #1.

NO.	REFERENCES	DWG. NO.
1	DIAGRAM DRAIN COLLECTING SYS – LIST	6555-465

HULL NO. 613C, 614C | DWG. NO. 6555-467 | SHEET 2 OF

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P3AQ	2" IPS x SCH 40 STL PIPE	PMO 6555-468	PS	
	2	1	P4AR	1½"			
	3	1	P4AS				
	4	1	P4AT				
	5	130'0"	P5	1"	S/ 57-06-104K		
E	6	100 FT	P50	1½" SCH-40 STL PIPE	S 57-06-106		
	7	11	F13	1" UNION STL SW	PO ⑲ 6555-C8	MD-PS	
	8	3	F9	1" TEE STL SW 3000#	S/ 25-60-079	ST-PS	
	9	5	F6	1" COUPLING STL SW 3000#	S/ 25-60-055		
	10	15	H13	1" HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-346		
	11	5	H13	1½	S/ 25-48-366		
	12	2	H13	2"	S 25-48-376		
E	13	10	F100	1½" TEE STL. S.W.	S 25-60-081	ST-PS	
E	14	10	F101	1½" UNION M.I. SCRD	S 25-12-172		
E	15	6	F102	1½" COUPLING STL. S.W.	S 25-60-056		
E	16	15	F103	1½" SPECIAL FUNNEL Assy "14-A" 283097	MO 283097-6 SH. 14 L1		
E	17	7	F104	FUNNEL COVER FOR ONE ¾" PIPE	SH. 14 L10		
E	18	8	F105	FUNNEL COVER FOR TWO ¾" PIPES	SH 14 L 7		

REMARKS –

SERVICE – LP ST DR SYS

APPLICABLE HULLS 613C 614C | GROUP NO. PS-161 6555-0114-1002 PI SHT 1 OF 2 | DWG NO. 6555-467 | SHEET 3 | REV. E

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V1335	1½" SWING CHK SCR'D BRONZE	S ⑮ 6450-C27	MD-PS	
	2	1	V1336				
	3	1	V1417				
	4	1	V1418				
	5	1	V1419				
	6	1	V1460				
	7	1	V1461				
	8	1	V1462				
	9	1	V1463				
	10	1	V3070				
	11	1	V3071	1"	PO ⑮ 6450-C27		
	12						
	13						
	14						
	15						
	16						
	17						
E	18	6	F106	1½" 90° ELL STL. S.W.	S 25-60-010		

REMARKS –

SERVICE – LP ST DR SYS

APPLICABLE HULLS 613C 614C | GROUP NO. PS-161 6555-0114-1002 PI SHT 2 OF 2 | DWG NO. 6555-467 | SHEET 4 | REV. E

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P3AN	2" IPS x SCH 40 STL PIPE	PMO 6555-468	PS	
	2	1	P3AP	2"			
	3						
	4						
	5	4	H13	2" HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-376	ST-PS	
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS –

SERVICE – LP ST DR SYS

APPLICABLE HULLS 613C 614C | GROUP NO. PS-161 6555-0113-1202 PI SHT 1 OF 1 | DWG NO. 6555-467 | SHEET 5 | REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P4AW	1½" IPS x SCH 40 STL PIPE	PMO 6555-468	PS	
	2	1	P4AX				
	3	70'0"	P5	1"	S/ 57-06-104K		
	4	18'0"	P7	½" IPS x SCH 80 STL PIPE	S/ 57-07-102K		
	5						
	6	2	F1	½" TEE STL SW 3000#	S/ 25-60-077	ST-PS	
	7	2	F2	½ UNION STL SW	PO ③ 6555-C9	MD-PS	
	8	4	F3	¾" x ½" INSERT RED. SW STL 3000#	S/ 25-60-364	ST-PS	
	9	2	F4	¾" ST TRAP STL SW (AUX EXH LOW POINT)	PO ③ 6555-C1	MD-PS	
	10	18	F5	½" ELL 90° STL SW 3000#	S/ 25-60-006	ST-PS	
	11	1	F7	FUNNEL(1) ½" IN x 1" OUT STL W/COVER	MO 283132 S4 L1		
	12	1	F9	1" TEE STL SW 3000#	S/ 25-60-079		
	13	2	F13	1" UNION STL SW	PO ⑲ 6555-C8	MD-PS	
	14	2	F15	8" DRAIN POT STL	MO 283132 S5 L11	ST-PS	
	15	2	F16	½" IPS NIPPLE X-HVY THR'D L=4"	S/ 25-14-855E		
	16	1	F20	1" x ½ INSERT RED. STL SW 3000#	S/ 25-60-369		
	17	2	F24	1" x 1" x ½" TEE STL SW 3000#	S/ 25-60-235		
	18	2	F6	1" COUPLING STL SW 3000#	S/ 25-60-054		

REMARKS –

SERVICE – LP ST DR SYS

APPLICABLE HULLS 613C 614C | GROUP NO. PS 157 6555-0106-1002 PI SHT 1 OF 2 | DWG NO. 6555-467 | SHEET 6 | REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V1359	½" GLOBE STOP SW 600# C-STL	PO ② 6450-M9	MD-PS	
	2	1	V1360				
	3	1	V1361				
	4	1	V1362	½" SWING CHK SCR'D 200# BRONZE	PO ⑭ 6450-C27		
	5	1	V1363	½" GLOBE STOP SW 600# C-STL	PO ② 6450-M9		
	6	1	V1364				
	7	1	V1365				
	8	1	V1366	½" SWING CHK SCR'D 200# BRONZE	PO ⑭ 6450-C27		
	9	1	V3072	1"	⑮		
	10	1	V3116	1" SWING CHK SCR'D 200# BRONZE			
	11						
	12		FITTING Nº				
	13	1	F30	½" COUPLING STL SW 3000#	S/ 25-60-052	ST-PS	
	14	4	H13	1½ HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-366		
	15	10	H13	1"	S/ 25-48-346		
	16	2	H13	½"	S/ 25-48-326		
	17	3	F18	½" DECK SLEEVE CS	S/ 25-20-386		
	18						

REMARKS –

SERVICE – LP ST DR SYS

APPLICABLE HULLS 613C 614C | GROUP NO. PS 157 6555-0106-1002 PI SHT 2 OF 2 | DWG NO. 6555-467 | SHEET 7 | REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P3AE	2" IPS x SCH 40 STL PIPE	PMO 6555-468	PS	
	2	1	P3AF				
	3	1	P3AG				
	4	1	P3AH				
	5	1	P3AJ				
	6	1	P1T	4" IPS			
	7	36"	P5	1" IPS x SCH 40 STL PIPE	S/ 57-06-104K		
	8	1	F31	4" BACKING RING STL STD	S/ 97-18-131	ST-PS	
	9	1	F13	1" UNION STL SW	PO ⑲ 6555-C8	MD-PS	
	10	2	F14	1" ELL 90° STL SW 3000#	S/ 25-60-008	ST-PS	
	11	1	F22	FUNNEL (2) ½" INLET 1" OUT STEEL W/COVER	MO 283132 S4 L6		
	12	2	H13	4" HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-416		
	13	8	H13	2" HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-376		
	14	1	V3068	1" SWING CHK SCR'D 200# BRONZE	PO ⑮ 6450-C27	MD-PS	
	15	1	V1313	4" GLOBE STOP VALVE FLG'D 150# C-STL	FURN WITH PIPE DET ON 6555-468	PS	
	16	1	V3065	4" SWING CHECK VALVE FLG'D 150# C-STL			
	17						
	18						

REMARKS –

SERVICE – LP ST DR SYS

APPLICABLE HULLS 613C 614C | GROUP NO. PS 157 6555-0104-1205 PI SHT 1 OF 1 | DWG NO. 6555-467 | SHEET 8 | REV. A

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	8	Z6	4" 150#	BOLTS	⅝" HVY HEX HD STL L=3"	PO ㉕ 6000-C7	MD-PS	
	2	8			NUTS	⅝" HVY HEX STL	PO ㉕ 6000-C12		
	3	1			GSKT	1/16" THK COMPR ASBESTOS	S/ 15-01-278E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS –

SERVICE – LP ST DR SYS

APPLICABLE HULLS 613C 614C | GROUP NO. PS 157 6555-0104-1205 PI SHT 2 OF 2 | DWG NO. 6555-467 | SHEET 9 | REV. A

6555-467

SEPT. '80

FRAME

8X

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3AK	2"IPS x SCH 40 STL PIPE	PMD 6555-468	PS	
		2	1	P3AL				
		3	1	P3AM				
		4	1	P4AV	1 1/2"			
		5	7'0"	P5	1"	S/ 57-06-104K		
		6						
		7						
		8	5	H13	2" HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-376	ST-PS	
		9	1	H13	1 1/2	S/ 25-48-366		
		10	1	H13	1"	S/ 25-48-346		
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - LP ST DR SYS

PS 159

GROUP NO. 6555-0105-1202 PI SHT 1 OF 1

APPLICABLE HULLS 613C 614C

DWG NO. 6555-467 SHEET 10 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2C	3"IPS x SCH 40 STL PIPE	PMD 6555-468	PS	
		2	1	P4V	1 1/2"			
		3	1	P4W	1 1/2"			
		4						
		5	12'-0"	P5	1" IPS X SCH 40 STL PIPE	S/ 57-06-104K	PS	
		6						
		7						
		8	1	F13	1" UNION STL SW	PO ⑲ 6555-C8	MD-PS	
		9	2	F14	1"90° ELL STL SW 3000#	S/ 25-60-008	ST-PS	
		10	1	F33	3" BACKING RING STL STD	S/ 97-18-126		
		11	2	H13	3" HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-396		
		12	4	H13	1 1/2"	S/ 25-48-366		
		13	2	H13	1"	S/ 25-48-346		
		14	1	V1442	1" SWING CHK VALVE SCR'D BRONZE 200#	PO ⑮ 6450-C27	MD-PS	
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - LP ST DR SYS

PS 161

GROUP NO. 6555-0115-1006 PI SHT 1 OF 1

APPLICABLE HULLS 613C 614C

DWG NO. 6555-467 SHEET 11 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1N	4" IPS x SCH 40 STL PIPE	PMD 6555-468	PS	
		2	1	P1P				
		3						
		4	50'-0"	P5	1"IPS x SCH 40 STL PIPE	S/ 57-06-104K	PS	
		5	1	F6	1" COUPLING STL SW 3000#	S/ 25-60-054	ST-PS	
		6	1	F7	FUNNEL 1/2" INLET 1" OUT STL W/COVER	MD 283132 S4 L1		
		7	1	F9	1" TEE STL SW 3000#	S/ 25-60-079		
		8	2	F13	1" UNION STL SW	PO ⑲ 6555-C8	MD-PS	
		9	3	F14	1" ELL 90° STL SW 3000#	S/ 25-60-008	ST-PS	
		10	3	F31	4" BACKING RING STL STD	S/ 97-18-131		
		11	3	H13	4" HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-416		
		12	8	H13	1"	S/ 25-48-346		
		13						
		14	1	V1381	1" SWING CHK VALVE SCR'D 200# BRONZE	PO ⑮ 6450-C27	MD-PS	
		15	1	V3066	1"			
		16						
		17						
		18						

REMARKS -

SERVICE - LP ST DR SYS

PS 157

GROUP NO. 6555-0104-1104 PI SHT 1 OF 1

APPLICABLE HULLS 613C 614C

DWG NO. 6555-467 SHEET 12 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1J	4"IPS X SCH 40 STL PIPE	PMD 6555-468	PS	
		2	1	P1K				
		3	1	P1M				
		4						
		5						
		6						
		7	3	F31	4" BACKING RING STL STD	S/ 97-18-131	ST-PS	
		8	5	H13	4 HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-416		
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - LP ST DR SYS

PS 159

GROUP NO. 6555-0105-1103 PI SHT 1 OF 1

APPLICABLE HULLS 613C 614C

DWG NO. 6555-467 SHEET 13 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2F	3"IPS X SCH 40 STL PIPE	PMD 6555-468	PS	
		2	10'-0"	P5	1"	S/ 57-06-104K		
		3						
		4						
		5	1	F13	1" UNION STL SW	PO ⑲ 6555-C8	MD-PS	
		6	1	F33	3" BACKING RING STL STD	S/ 97-18-126	ST-PS	
		7						
		8	1	V1443	1" SWING CHK VALVE SCR'D BRONZE 200#	PO ⑮ 6450-C27	MD-PS	
		9						
		10	2	H13	3" HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-396	ST-PS	
		11	2	H13	1"	S/ 25-48-346		
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - LP ST DR SYS

PS 161

GROUP NO. 6555-0113-1107-PI SHT 1 OF 1

APPLICABLE HULLS 613C 614C

DWG NO. 6555-467 SHEET 14 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P1H	4"IPS x SCH 40 STL PIPE	PMD 6555-468	PS	
		2	1	P1L				
		3	1	P1R				
		4	1	P1S				
		5	1	P1U				
		6	1	P2D	3			
		7	1	P2E				
		8	1	P2G				
		9	1	P2AC				
		10	1	P3AB	2"			
		11	1	P3AD				
		12	1	P4X	1 1/2"			
		13	1	P4Y				
		14	1	P4Z				
D		15	1	P1Q	4"IPSxSCH 40 STL PIPE	PMD 6555-468	PS	
D		16	1	P4AA	1 1/2"IPSxSCH 40 STL PIPE			
		17						
		18						

REMARKS -

SERVICE - LP ST DR SYS

PS 175

GROUP NO. 6555-0115-1008 SI SHT 1 OF 9

APPLICABLE HULLS 613C 614C

DWG NO. 6555-467 SHEET 15 REV. D

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	167'-0"	P5	1"IPS x SCH 40 STL PIPE	S/ 57-06-104K	PS	
		2	110'-0"	P6	3/4" IPS x SCH80	S/ 57-07-103K		
		3	36'-0"	P7	1/2"	S/ 57-07-102K		
		4	40'-0"	P8	1/4"	S/ 57-07-100K		
		5	36"	P9	1/2"IPSx SCH80 1 1/4CR-1/2MO PIPE	PO ⑩ 6440-C9	MD-PS	
		6	60"	P10	3/4"	PO ⑪ 6440-C9		
		7						
		8						
		9		FITTING No				
		10	8	F6	1" COUPLING STL SW 3000#	S/ 25-60-054	ST-PS	
		11	15	F30	1/2"	S/ 25-60-052		
		12	5	F31	4" BACKING RING STL STD	S/ 96-18-131		
		13	5	F32	3/4" COUPLING STL SW 3000#	S/ 25-60-053		
		14	4	F33	3" BACKING RING STL STD	S/ 97-18-126		
		15	6	F34	1/4" COUPLING STL SW 3000#	S/ 25-60-050		
		16						
		17						
		18						

REMARKS -

SERVICE - LP ST DR SYS

PS 175

GROUP NO. 6555-0115-1008 SI SHT 2 OF 9

APPLICABLE HULLS 613C 614C

DWG NO. 6555-467 SHEET 16 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	8	F1	1/2" TEE STL SW 3000#	S/ 25-60-077	ST-PS	
		2	27	F2	1/2" UNION STL SW.	PO ③ 6555-C9	MD-PS	
		3	14	F3	3/4"x1/2" INSERT RED. STL SW 3000#	S/ 25-60-364	ST-PS	
		4	3	F4	3/4" STEAM TRAP STL SW. (FOR AUX EXH SYS)	PO ③ 6555-C1	MD-PS	
		5	2	F5	1/2" ELL 90° STL SW 3000	S/ 25-60-027	ST-PS	
		6	4	F7	FUNNEL 1/2" IN x 1" OUT	MD 283132 S4 L1		
		7	4	F9	1" TEE STL SW 3000#	S/ 25-60-079		
		8	5	F11	3/4" ELL 90° STL SW 3000#	S/ 25-60-028		
		9	1	F12	FUNNEL (2) 3/4" IN x 1" OUT	MD 283132 S4 L11		
		10	17	F13	1" UNION STL SW	PO ⑲ 6555-C8	MD-PS	
		11	1	F14	1" ELL 90° STL SW 3000#	S/ 25-60-029	ST-PS	
		12	3	F20	1"x1/2" INSERT REDUCER STL SW 3000#	S/ 25-60-369		
	D	13	10	F25	3/4"x1/2" INSERT REDUCER SW 1 1/4CR-1/2 MO 3000#	MD 216686-4 SH-13 L1		
		14	5	F26	1/4" UNION STL SW	PO ⑰ 6555-C8	MD-PS	
		15	9	F27	3/4"	PO ㉑ 6555-C8		
		16	15	F28	SPLASH PLATE 6"x6"x1/2" STL PL	S/ 71-30-860	PS	
		17	3	F29	3/4"x1/2 BUSHING STL THREADED	S/ 25-05-218	ST-PS	
		18	1	F24	1"x1"x1/2" TEE STL SW 3000#	S/ 25-60-235		

REMARKS -

SERVICE - LP ST DR SYS

PS 175

GROUP NO. 6555-0115-1008 SI SHT 3 OF 9

APPLICABLE HULLS 613C 614C

DWG NO. 6555-467 SHEET 17 REV. D

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	VALVE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	C	1	1	V1312	4" GLOBE STOP FLGD 15 CARBON STL	PO ⑦ 6450-M4	ST-PS	
		2	1	V1343	1/2" GLOBE STOP SW 600 C-STL	PO ② 6450-M9	MD-PS	
C		3	1	V1344	1/2" AIR DIAPHRAGM OPERATED ANGLE STOP VALVE 1500# FLG	PO ① 6555-C15		
		4	1	V1345	1" SWING CHECK BRONZE 200# SCR'D	PO ⑮ 6450-C27	MD-PS	
		5	1	V1382				
		6	1	V1396				
		7	1	V1397				
		8	1	V1398				
		9	1	V1399				
		10	1	V1415				
		11	1	V1416				
		12	1	V3115				
B		13	1	V1499	1/2" GLOBE STOP VLV SW 600# C/STL	PO ② 6450-M9		
B		14	1	V1500	1/2"			
B		15	1	V1501	1/2"			
B		16	1	V1502	1/2"			
B		17	1	V1503	1/2"			
		18						

REMARKS -

SERVICE - LP ST DR SYS

PS 175

GROUP NO. 6555-0115-1008 SI SHT 4 OF 9

APPLICABLE HULLS 613C 614C

DWG NO. 6555-467 SHEET 18 REV. C

6555-467

MICRO-MASTER® 105 mm

K+E

ARLINGTON • WASHINGTON • BETHESDA

ALEXANDRIA • RICHMOND • NORFOLK

® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

6555-467

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1						
	2	1	V1494	1/2" GLOBE STOP SW 600# C-STL	PO ② 6450-M9	MD-PS	
	3	1	V1495				
	4	1	V1496				
	5	1	V1497				
	6	1	V1508	3/4" GLOBE STOP SW 900# 1 1/4 CR-1/2 MO STL	PO ② 6440-M7		
	7	1	V1509				
	8	1	V1510				
	9	1	V1511				
	10	1	V1512				
	11	1	V1513				
	12	1	V1514				
	13	1	V1515				
	14	1	V1516				
	15	1	V1517				
	16	1	V3080	1/2" GLOBE STOP SW 900# 1 1/4 CR-1/2 MO STL	PO ① 6440-M7		
	17	1	V3081				
	18	1	V3082				

REMARKS -

SERVICE - LP ST DR SYS

PS 175

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0115-1008-SI SHT 5 OF 9	DRG NO. 6555-467	SHEET 19	REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V3083	1/2" GLOBE STOP SW 900# 1 1/4 CR-1/2 MO	PO ① 6440-M7	MD-PS	
	2	1	V3084				
	3	1	V3085				
	4	1	V3086				
	5	1	V3087				
	6	1	V3088	3/4" GLOBE STOP SW 600# C-STL	PO ⑥ 6450 M9		
	7	1	V3089				
	8	1	V3090				
	9	1	V3091				
	10	1	V3092	1/2"	②		
	11	1	V3093				
	12	1	V3094				
	13	1	V3095				
	14	1	V3096	1/2" GLOBE STOP SCR'D BRONZE 200#	PO ③ 6450-C27		
	15	1	V3097				
	16	1	V3098				
	17	1	V3099	1/2" SWING CHECK SCR'D BRONZE 200#	⑭		
	18	1	V3100	1/2" GLOBE STOP SCR'D BRONZE 200#	③		

REMARKS -

SERVICE - LP ST DR SYS

PS 175

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0115-1008-SI SHT 6 OF 9	DRG NO. 6555-467	SHEET 20	REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V3101	1/2" GLOBE STOP SCR'D 200# BRONZE	PO ③ 6450-C27	MD-PS	
	2	1	V3102				
	3	1	V3103	1/2" SWING CHECK SCR'D 200# BRONZE	⑭		
	4	1	V3104	1/2" GLOBE STOP SCR'D 200# BRONZE	③		
	5	1	V3105				
	6	1	V3106				
	7	1	V3107	1/2" SWING CHECK SCR'D 200# BRONZE	⑭		
	8						
	9	1	V3109	3/4" GLOBE STOP SW 900# 1 1/4 CR-1/2 MO	PO ② 6440-M7	MD-PS	
	10	1	V3110				
	11	1	V3111	1/2" SWING CHECK SCR'D 200# BRONZE	PO ⑭ 6450-C27		
	12	1	V3112	1/2"			
	13	1	V3067	1"	⑮		
	14	1	V3069	1"			
C	15	1	V3073	3/4" GLOBE STOP SW 600# C-STL	PO ⑥ 6450-M9		
	16	1	V3113	1/2" GLOBE STOP SW 900# 1 1/4 CR-1/2 MO STL	PO ① 6440-M7		
	17	1	V3114	1/2			
	18						

REMARKS -

SERVICE - LP ST DR SYS

PS 175

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0115-1008 SI SHT 7 OF 9	DRG NO. 6555-467	SHEET 21	REV. C

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	FLANGE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	10	J-7	1/2" FLG 900# SW 1 1/4 CR-1/2 MO	PO ④ 6440-C12	MD-PS	
	2	1	J-8	3/4" FLG 600# SW C-STL	PO ⑧ 6450-C47		
	3	5	J-6	1/2"	PO ⑦ 6450-C47		
C	4	2	J-9	1500#	PO 608C ㉜ 6450-C2	ST-PS	
	5						
	6		HANGER Nº				
	7	10	H13	4" HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-416	ST-PS	
	8	10	H13	3"	S/ 25-48-396		
	9	5	H13	2"	S/ 25-48-376		
	10	4	H13	1 1/2	S/ 25-48-366		
	11	15	H13	1"	S/ 25-48-346		
	12	10	H13	3/4"	S/ 25-48-336		
	13	30	H13	1/2"	S/ 25-48-326		
	14	7	H13	1/4"	S/ 25-48-304		
B	15	1	V3008	1/2" GLOBE STOP VLV SW 600# C/STL	PO ② 6450-M9	MD-PS	
B	16	1	V3009	1/2"			
B	17	1	V3010	1/2"			
B	18	1	V3011	1/2"			

REMARKS -

SERVICE - LP ST DR SYS

PS 175

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0115-1008 SI SHT 8 OF 9	DRG NO. 6555-467	SHEET 22	REV. C

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	20	Z5	1/2" 600#	BOLTS	STUD 1/2" ALLOY STL B7 L=3 1/4	S/ 21-18-526	ST-PS	
	2	40			NUTS	1/2" HVY HEX ALLOY STL GR 4	S/ 21-31-100		
	3	5			GSKT	FLEXITALLIC STYLE CG	S/ 15-04-098		
	4	32	Z6	4" 150#	BOLTS	5/8" HVY HEX HD STL L=3"	PO 6000-C7 ㉘	MD-PS	
	5	32			NUTS	5/8" HVY HEX STL	PO 6000-C12 ⑯		
	6	4			GSKT	1/16 THK COMPR ASBESTOS	S/ 15-01-278E	ST-PS	
C	7	48	Z7	1/2" 1500#	BOLTS	STUD 3/4" B16 ALLOY STL L=4 1/2	PO 6440-C21 ⑧	MD-PS	
C	8	96			NUTS	3/4" HVY HEX GR7 ALLOY STL	PO 6440-C21 ⑨		
C	9	12			GSKT	FLEXITALLIC STYLE CG	S/ 15-04-140	ST-PS	
	10	4	Z8	3/4" 600#	BOLTS	STUD 5/8" ALLOY STL B7 L=3 1/2	S/ 21-18-528		
	11	8			NUTS	5/8" HVY HEX ALLOY STL GR4	S/ 21-31-100		
	12	1			GSKT	FLEXITALLIC STYLE CG	S/ 15-04-100		
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - LP ST DR SYS

PS 175

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0115-1008-SI SHT 9 OF 9	DRG NO. 6555-467	SHEET 23	REV. C

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P2A	3" IPS X SCH 40 STL PIPE	PMO 6555-467	PS	
	2	1	P2B				
	3	35'-0"	P5	1" IPS	S/ 57-06-104K		
	4	45'-0"	P6	3/4" IPS X SCH 80 STL PIPE	S/ 57-07-103K		
E	5	100'-0"	P7	1/2" IPS	S/ 57-07-102K		
E	6	160'	P9	1/2" IPS X SCH 80 1 1/4 CR-1/2 MO STL PIPE	PO ⑩ 6440-C9	MD-PS	
	7	40'-0"	P10	3/4" IPS	PO ⑪ 644-C9		
	8	10'-0"	P11	1" IPS X SCH 80 STL PIPE	S/ 57-07-114K	PS	
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

613C-143 27

SERVICE - LP ST DR SYS

PS 180

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0117-1009 SI SHT 1 OF 7	DRG NO. 6555-467	SHEET 24	REV. E

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	FITTING NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	6	F1	1/2" TEE STL SW 3000#	S/ 25-60-077	ST-PS	
	2	6	F2	1/2" UNION STL SW	PO ③ 6555-C9	MD-PS	
	3	4	F3	3/4" x 1/2" INSERT RED STL	S/ 25-60-364	ST-PS	
	4	2	F4	3/4" ST TRAP STL SW (ST TO DSTL PLANT)	PO ③ 6555-C1	MD-PS	
	5	4	F5	1/2" ELL 90° STL SW 3000#	S/ 25-60-027	ST-PS	
B	6	1	F7A	FUNNEL 1/2" INLET 1" OUT STL W/COVER	MO 283132 S3 L15		
D	7	~~2~~	~~F8~~	~~FUNNEL 1" INLET 1" OUT STL W/COVER~~	MO ~~283132~~ S5 L1		
	8	4	F9	1" TEE STL SW 3000#	S/ 25-60-079		
	9	2	F10	1" ORIFICE W/1/8" D HOLE 600# CRES 216670 ㊽	MO 216670 S7 L13		
	10	4	F11	3/4" ELL 90° STL SW 3000#	S/ 25-60-028		
	11	6	F12	FUNNEL (2) 3/4" INLET 1" OUT STL W/COVER	MO 283132 S4 L11		
	12	2	F6	1" COUPLING STL SW 3000#	S/ 25-60-054		
	13	4	F19	3/4" ELL 90° 1 1/4 CR-1/2 MO STL 3000#	PO 608C ⑤ 6440-M5	MD-PS	
	14	2	F32	3/4" COUPLING STL SW 3000#	S/ 25-60-053	ST-PS	
	15	2	F21	FUNNEL (1) 3/4" INLET 1" OUT STL W/COVER	MO 283132 S5 L6		
	16	2	F30	1/2" COUPLING STL SW 3000#	S/ 25-60-052		
	17	2	F33	3" BACKING RING STL STD	S/ 97-18-126		
D	18	2	F-14	1" ELL 90° STL S.W. 3000#	S/ 25-60-008	ST-PS	

REMARKS -

SERVICE - LP ST DR SYS

PS 180

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0117-1009 SI SHT 2 OF 7	DRG NO. 6555-467	SHEET 25	REV. D

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	ITEM Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	3	H13	3" HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-396	ST-PS	
	2	5	H13	1" HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-346		
	3	6	H13	3/4	S/ 25-48-336		
	4	10	H13	1/2"	S/ 25-48-326		
D	5	2	F36	1" ELL 90° STL THD'D 2000#	S/ 25-09-108	ST-PS	
	6	4	F37	3/8" THK STL COVER 7" DIA	X42 TAKE FROM SCRAP	PS	
	7	2	F38	1" NIPPLE THD'D X-HVY L=6" STL	S/ 25-14-404E	ST-PS	
	8	2	F39	1" COUPLING THD'D 3000# STL	S/ 25-07-108		
	9	2	F40	1" PLUG THD'D STL 3000#	S/ 25-17-290		
	10	2	F41	5" IPS PIPE STL L=6"	X42 TO TAKE FROM SCRAP	PS	
	11	2	F-13	1" UNION - STL - SW	PO ⑲ 6555-C8	ST-PS	
E	12	1	F42	1/2" TEE SW 3000# SS 304	97-14-341	ST-PS	
E	13	3	F43	1/2 TEE SW 3000# STL	25-60-077		
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - LP ST DR SYS

PS 180

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0117-1009 SI SHT 3 OF 7	DRG NO. 6555-467	SHEET 26	REV. E

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V1333	1" GLOBE STOP SW 600# C-STL	PO ⑨ 6450-M9	MD-PS	
	2	1	V1334	1"			
	3	1	V1341	1/2" GLOBE STOP SW 900# 1 1/4 CR-1/2 MO STL	PO ① 6440-M7		
C	4	1	V1342	1/2" AIR DIAPHRAGM OPERATED ANGLE STOP VALVE FLG 1500#	PO ① 6555-C15	MD-PS	
	5	1	V1367	1/2" GLOBE STOP SCR'D 200# BRONZE	PO ③ 6450-C27	MD-PS	
	6	1	V1368				
	7	1	V1369				
	8	1	V1370				
	9	1	V1371				
	10	1	V1372				
	11	1	V1420	1/2" GLOBE STOP SW 900 C-STL	PO ① 6552-C3		
	12	1	V1421				
	13	1	V1422				
	14	1	V1423				
	15	1	V1424				
	16	1	V1425				
	17	1	V1426				
	18	1	V1427				

REMARKS -

SERVICE - LP ST DR SYS

PS 180

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0117-1009 SI SHT 4 OF 7	DRG NO. 6555-467	SHEET 27	REV. G

6555-467

MICRO-MASTER® 105 mm

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SEPT. '80

FRAME

8X

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	VALVE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1		V1444	3/4" GLOBE STOP SW 900# C-STL	PO ③ 6552-C3	MD-PS	
		2		V1445				
		3		V1446				
		4		V1447				
		5		V1448				
		6		V1449				
		7		V1450				
		8		V1451				
		9		V1452	3/4" GLOBE STOP SW 900# 1¼ CR-½ MO STL	PO ② 6440-M7		
		10		V1453				
		11		V1454				
		12		V1455				
		13		V1456				
		14		V1457				
		15		V1458				
		16		V1459				
		17						
		18						

REMARKS -

SERVICE - LP ST DR SYS

PS 180

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0117-1009 SI SHT 5 OF 7	DRG NO. 6555-467	SHEET 28	REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	FLANGE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	J2	3/4" FLANGE STL 150# SW	S/ 25-18-841	ST-PS	
		2	1	J3	3/4" FLANGE 900# SW 1¼ CR-½ MO STL	PO ⑤ 6440-C12	MD-PS	
		3	4	J4	1" FLANGE 600# SW C-STL	PO ⑨ 6450-C47		
		4	1	J5	½"	FURN ON SSTG	—	
		5	4	J6	½"	PO ⑦ 6450-C47	MD-PS	
C		6	1	J9	½ FLANGE 1500# STL SW	P.O. ① 6552-C24	ST-PS	
C		7	1	J10	½ FLANGE 1500# SW 1¼ CR-½ MO	PO ④ 6440-M12		
B		8	1	V3061	¾" GLOBE STOP VLV 1-¼CR-¼MO SW 900#	PO ② 6440-C7	MD-PS	
B		9	1	V3062	¾"			
B		10	1	V3063	¾"			
B		11	1	V3064	¾"			
E		12	1	V3140	½" GLOBE STOP SW 900# 1¼CR-½MO STL	PO ① 6440-M7	ST-PS	
E		13	1	V3141	½" GLOBE STOP SW 600# STL	26-09-275		
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - LP ST DR SYS

PS 180

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0117-1009 SI SHT 6 OF 7	DRG NO. 6555-467	SHEET 29	REV. E

FLANGED JOINT LIST & GROUP

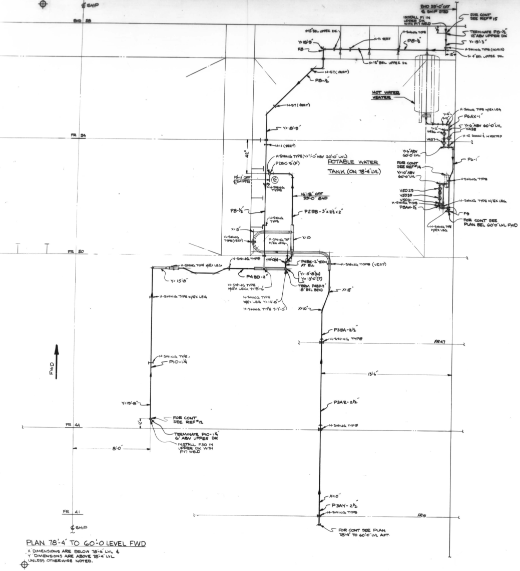
REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	8	Z1	3" 150#	BOLTS	5/8" HVY HEX HD STL L=2½"	PO 6000-C7 ㉗	MD-PS	
	2	8			NUTS	5/8" HVY HEX STL	PO 6000-C12 ⑥		
	3	2			GSKT	1/16" THK COMPR ASBESTOS	S/15-01-274E	ST-PS	
	4	4	Z2	¾" 150#	BOLTS	½" HVY HEX HD STL L=1¾"	PO 6000-C7 ㉒	MD-PS	
	5	4			NUTS	½" HVY HEX STL	PO 6000-C11 ①		
	6	1			GSKT	1/16" THK COMPR ASBESTOS	S/15-01-262E	ST-PS	
	7	8	Z4	1" 600#	BOLTS	STUD 5/8" H7 ALLOY STL L=4¼	S/21-18-546		
	8	16			NUTS	5/8" HVY HEX GR4 ALLOY STL	S/21-31-102		
	9	4			GSKT	FLEXITALLIC STYLE CG	S/15-04-102		
	10	20	Z5	½" 600#	BOLTS	STUD ½" H7 ALLOY STL L=3¼"	S/21-18-526		
	11	40			NUTS	½" HVY HEX GR4 ALLOY STL	S/21-31-100		
	12	5			GSKT	FLEXITALLIC STYLE CG	S/15-04-098		
	13	4	Z3	¾" 1500#	BOLTS	STUD ¾" H16 ALLOY STL L=4¾"	PO 6440-C21	MD-PS	
	14	8			NUTS	¾" HVY HEX GR7 ALLOY STL	PO 6440-C21		
	15	1			GSKT	FLEXITALLIC STYLE CG	S/15-04-142	ST-PS	
C	16	8	Z7	½ 1500#	BOLTS	STUD ½" B16 ALLOY STL	PO 6440-C21		
C	17	16			NUTS	½" HVY HEX GR 7 ALLOY STL	PO 6440-C21		
C	18	2			GSKT	FLEXITALLIC STYLE CG	15-04-140		
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - LP ST DR SYS

PS 180

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0117-1009 SI SHT 7 OF 7	DRG NO. 6555-467	SHEET 30	REV. C


℄ SHIP
BHD 58
FR 54
FR 50
FR 47
FR 44
FR 41
FR41
BHD 39'-0" OFF ℄ SHIP STBD
FOR CONT SEE REF# 15
INSTALL F1 IN UPPER DK WITH P17 WELD
TERMINATE P8-½" 12" ABV UPPER DK
Y= 19'-3"
H-SWING TYPE (HORIZ)
X= 4" BEL UPPER DK
12"
X=15" BEL UPPER DK
H-11 VERT
H-SWING TYPE
P8-½"
Y= 18'-9"
F8
X= 15" BEL UPPER DK
H-57 (VERT)
P8-½"
HOT WATER HEATER
H-57 (VERT)
Y= 18'-9"
H-11 (VERT)
42"
H-SWING TYPE (Y=7'-0" ABV 60'-0" LVL)
P2BG 3"(F)
POTABLE WATER TANK (ON 78'-4" LVL)
19'-11" OFF ℄ SHIP(S)
E
H-SWING TYPE
16'-8" OFF 33'-0" BHD
P8-½"
P2BB-3"x2½"x2"
H-SWING TYPE
X=15"
H-SWING TYPE (VERT)
H-SWING TYP W/EX LEG
X=13
H-SWING TYPE W/EX LEG
Y=6"
Y=12"
P6AX-1"
Y=6" ABV 60'-0" LVL
V438
V436
V437
H-12 DOWN & INVERTED
Y=6" ABV 60'-0" LVL
P6-1"
FOR CONT SEE REF#14
Y=10" ABV 60'-0" LVL
H-SWING TYPE
V5029
V5030
V5031
H-SWING TYPE
P8AW-½"
H-SWING TYPE W/EX LEG
F9
FOR CONT SEE PLAN BEL 60'-0" LVL FWD
H-SWING TYPE W/EX LEG
H-SWING TYPE W/EX LEG
H-SWING TYPE
Y=11'-0(N)
P4BE-2" TERM AT ELL
H-SWING TYPE (VERT)
Y= 15'-8"
P4BD-2"
Y= 15'-8(N)
Y= 13'-0"(F)
H-SWING TYPE W/EX LEG Y=18'-6"
TERM P4BD-2" 18" BEL BEND
X=15"
H-SWING TYPE W/EX LEG
H-SWING TYPE W/EX LEG Y=14'-8"
H-SWING TYPE Y=7'-0"
X=10"
P3BA-2½"
H-SWING TYPE
FWD
H-SWING TYPE
P10-1¼
13'-6"
Y=19'-8"
P3AZ-2½"
FOR CONT SEE REF#12
12"
H-SWING TYPE
TERMINATE P10-1¼" 6" ABV UPPER DK
INSTALL F30 IN UPPER DK WITH P17 WELD
8'-0"
X=10"
P3AY-2½"
H-SWING TYPE
FOR CONT SEE PLAN 78'-4" TO 60'-0" LVL AFT.

PLAN 78'-4" TO 60'-0 LEVEL FWD

X DIMENSIONS ARE BELOW 78'-4" LVL &
Y DIMENSIONS ARE ABOVE 78'-4" LVL
UNLESS OTHERWISE NOTED.

REVISIONS

N.N. CHANGE ORDER NO.	REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
—	A	ALL	INITIAL ISSUE	1/6/7		–	–
—	B		ALT DR FROM PORT & STBD F.O. SET TKS TO SUIT DIAG MOD.				
			ENG. TECH'S COMMENTS INCORPORATED THROUGHOUT.	7/1/7		–	–
—	C	-	SIZE OF GENERATOR BLOW OVERBOARD PIPE CORRECTED TO SUIT REF #2 AND VENDORS EQUIPMENT	8/2/7		–	–
—	D	-	ALT'D RUN P4BG-2" DELETED RUN OF P7-¾ TO UPPER DK ADDED DWG# FOR REF 12	1/12/8		–	–
48	E	-	PLAN 78'-4" TO 60'-0" LVL FWD; ALT'D RUN OF P2BB-3", PLAN VIEW BEL 60'-0" LVL FWD ALT'D RUN OF P2AL-3". (WORK ACCOMPLISHED ON H613C)				
—		-	ADDED REF#17 ELEV D-D P2AM-3 WAS A P17 WELD TO 33'-0" FLAT	5/1/8			
—	F	-	ALT'D P3Y-2½ & P2X-3" WERE 26" BEL 33'-0" FLAT				
			PLAN VIEW BELOW 60'-0" LVL FWD; ALTERED RUN OF P3Z-2½. P4BU-2" WAS P4BT-2"	4/26/8			
			THE ABOVE ACCOMP ON H613C				
			PLAN VIEW BEL. 60'-0" LVL FWD; ALT'D RUN OF P4BG & P4BH (WORK ACCOMP ON 613C.)				
			ELEV "A-A"; ADDED VENT TO P3AA-2½". PART PLAN "A1-A1" ADDED TO SUIT (WORK ACCOMP ON 613C)				
			ELEV "G-G"; ADDED VENT TO P3S-2½". PART PLAN "G1-G1" ADDED TO SUIT. (WORK ACCOMP ON 613C)				
		1A	ADDED REF#18.				
			ELEV "D-D"; ADDED SALINITY CELL (F-43) (WORK ACCOMP ON 613C)			–	–
	G	–	EXTENDED VENT OFF OF CONTAMINATED STEAM GEN DRAIN COOLER.				
			ADDED PIPING FOR DRAINS OFF OF CONTAMINATED STEAM GENERATOR + INSPECTION TANK			—	—

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN DEVELOPED IN ACCORDANCE WITH REFERENCES 1 & 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD & AMERICAN BUREAU OF SHIPPING. SEE REF #1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS & SHALL MEET THE REQUIREMENTS OF THE U.S.C.G., ABS & REF #3.
4. COUPLINGS & BACKING RINGS SHOWN IN LIST OF MATERIAL ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS & HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS PUMPS & ETC.
6. NON DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REF #6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REF #1.
9. "X" DIMENSION IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT. "Y" DIMENSION IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
10. ALL PIPING ON THIS ARR IS CLASS II EXCEPT CONTAM. ST. GEN BLOW DOWN PIPING. PORT & STBD F.O. SETTLING TK HTG COIL DRAINS & STM TO FO HTR LOW POINT DRAIN.
12. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS: BUTT WELDS P-3, SOCKET WELDS P-14 & FLANGE WELDS P1A & P16A ON REF #3.
13. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY & MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
14. PIPE HANGERS AND TIE RODS INDICATED (H) ON PLAN ARE TO BE INSTALLED WITHIN 6" OF POSITION SHOWN. NO ADDITIONAL HANGERS MAY BE ADDED BETWEEN DRAIN POTS AND TRAPS. ADDITIONAL HANGERS MUST BE INSTALLED TO SUPPORT PIPING DOWNSTREAM OF TRAPS IN ACCORDANCE WITH REF #4.
15. ALL HOLE CUTS ARE PROVIDED ON STRUCTURAL DRAWINGS
16. INSULATION AND LAGGING SHALL BE IN ACCORDANCE WITH REF #5.

NO.	REFERENCES	DWG NO.
Ⓕ 18	PPING ARR. MISC. FLAT DRAINS - ER	2280-711
17	MACHY FLAT 33'-0" ABV ℄	1090-52
16	PP ARR DISCHARGE SEA CONN. ENG RM	6000-320
15	PP ARR CONTAM ST & EXH PIPING - UPPER DK	6450-773
14	PP ARR 220 PSI CONTAM STM SYS ER	6450-703
13	PP ARR SERV ST SYS UPPER DK AFT FR44	2652-257
12	PP ARR SERV ST SYS DK HOUSE (HOPEMAN DWG)	2652-260
11	PP ARR MN LO SUMP	6200-626
10	SERV ST SYS ARR STEER GEAR FLAT	2652-254
9	PP ARR HEATING STM SYS ER	2652-262
8	PP ARR 125 PSI CONTAM STM SYS ER	6450-743
7	PP ARR HTG COILS F.O. STOR. SET & LOW SULPHUR TKS	6951-122
6	PAINTING SCHEDULE	8300-40
5	DIRECTIONS FOR INSULATING & LAGGING PIPE	257322
4	STANDARD PIPE HANGERS	257056
3	FABRICATION & WELDING INSTR CL I & II PIPING	257035
2	DIAGRAM CONTAMINATED STEAM GEN. SYS - ARR	6450-693
1	DIAGRAM CONTAMINATED STEAM GEN SYS - LIST	6450-692

NNS&DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

SCALE ½" = 1 FT
DRAWN D.L. HOFFMAN
CHECKED H.M. EDGE
SECT MGR J.H. Johnson
DATE COMPL. 1-6-77
EXAMINED
AUTHORIZED
DATE 1-6-77
TECH APPROVAL 2-19-77
CSD APPROVAL R. L. Warrington

PIPING ARR CONTAMINATED STEAM DRAIN SYS - ENG RM PLAN, SECT & ELEV

USMA DESIGN 711-5-1162
USMA DWG NO.
HULL NO.
DWG NO. 6555-469
REV G
SHEET NO. 1 OF 1

DWG. REV - HULL APPLIC						
REV	NN HULLS ONLY					
A	YES	YES				
B	YES	YES				
C	YES	YES				
D	YES	YES				
E	YES	YES				
F	YES	YES				
G	YES	YES				

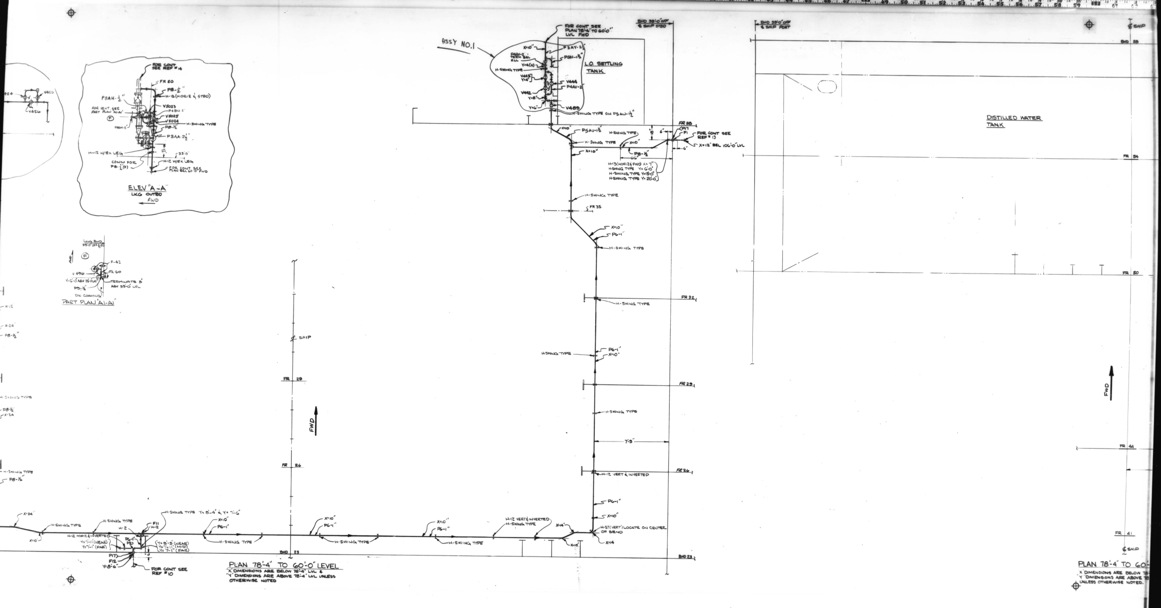
REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 3-20-9 SIGNED J.H. Johnson

GROUP:
MC NO.

6555-469

MICRO-MASTER 105 mm

SEPT. '80
FRAME 1
10X


ASSY NO.1
FOR CONT SEE PLAN 78'-4" TO 60'-0" LVL FWD
X=10"
P3AY-2½"
P5N-1½"
V=4(N)
H-SWING TYPE
V443
V444
P4AV-2"
V442
Y=8"
Y=6"
V489
H-SWING TYPE ON P5AU-1½"
L.O. SETTLING TANK
BHD 33'-0" OFF ℄ SHIP STBD
BHD 33'-0" OFF ℄ SHIP PORT
℄ SHIP
FR 38
P5AU-1½"
H-SWING TYPE
X=10"
FOR CONT SEE REF # 13
X=12" BEL 106'-0" LVL
P8-½"
H-13(HORIZ & FWD) X=7"
H-SWING TYPE Y=6'-0"
H-SWING TYPE Y=13'-0"
H-SWING TYPE Y=20'-0"
FR 35
P6-1"
FR 32
FR 29
FR 26
7'-9"
H-12 VERT & INVERTED
H-57(VERT) LOCATE ON CENTER OF BEND
X=14
BHD 23
℄ SHIP
FWD
FOR CONT SEE REF #14
FR 60
P8AH-½"
P8-½"
H-13 (HORIZ & STBD)
V5023
V5025
V5024
P8-½
P3AA-2½"
H-12 W/EX LEG
CONN FOR P8-½"(F)
33'-0
FOR CONT SEE PLAN BEL 60'-0" FWD
ELEV "A-A"
LKG OUTBD
FWD
LONG BHD 33'-0" OFF ℄
F-42
V-4316
FR 60
TERMINATE 3" ABV 33'-0" LVL
P8-½
DK COAMING
PART PLAN 'A1-A1'
V426
X=12
X=24
H-SWING TYPE
H-2
F11
H-12 HORIZ & INVERTED
Y=7'-11" (NEAR)
Y=7'-1" (FAR)
Y=8'-5" (NEAR)
Y=7'-11" (MID)
Y=7'-1" (FAR)
P17
F12
Y=8'-6"
FOR CONT SEE REF #10
H-SWING TYPE Y=8'-4" & Y=7'-6"
DISTILLED WATER TANK
FR 58
FR 54
FR 50
FR 44
FR 41
PLAN 78'-4" TO 60'-0" LEVEL
"X" DIMENSIONS ARE BELOW 78'-4" LVL & "Y" DIMENSIONS ARE ABOVE 78'-4" LVL UNLESS OTHERWISE NOTED
PLAN 78'-4" TO 60'-
X DIMENSIONS ARE BELOW 78'-
Y DIMENSIONS ARE ABOVE 78'
UNLESS OTHERWISE NOTED.

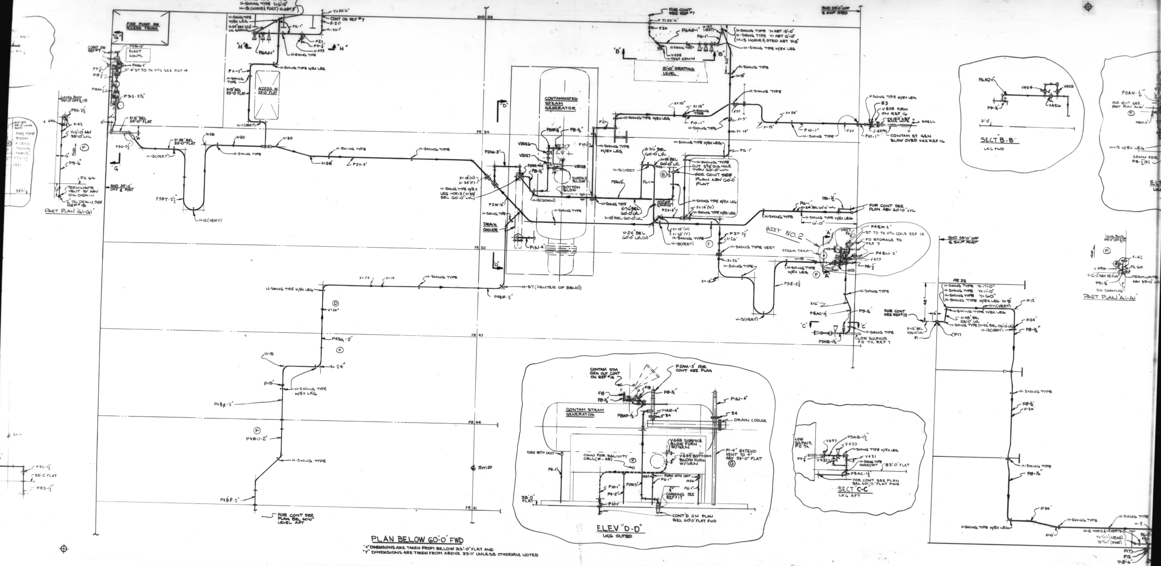
6555-469

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 2

10X


FIRE PUMP RM ACCESS TRUNK
BHD 58
BHD 39'-0" OFF ℄ SHIP STBD
ELECT CONTL
CONT ON REF #7
4" ST TO TK HTG SEE REF 14
ACCESS IN 33'-0" FLAT
H-SWING TYPE Y=13'-0"
H-SWING TYPE Y=6'-0"
H-13 (HORIZ & PORT) X=ABT 5'
H-SWING TYPE W/EX LEG
CONT ON REF #7
F-20
V493
H-SWING TYPE
FOR CONT SEE REF #7
Y=20'-6"
H-SWING TYPE Y=ABT 13'-0"
H-SWING TYPE Y=ABT 6'-0"
H-13 HORIZ & STBD ABT X=3'
H-SWING TYPE W/EX LEG
V495 TEST CONN
51'-0" GRATING LEVEL
CONTAMINATED STEAM GENERATOR
SURFACE BLOW
BOTTOM BLOW
DRAIN COOLER
FR 54
FR 50
FR 47
FR 44
FR 41
℄ SHIP
H-SWING TYPE W/EX LEG
H-11 (VERT)
H-13 (VERT)
H-13 (DOWN)
H-57 (CENTER OF BEND)
X=12" BEL 33'-0" FLAT
X=38" BEL 33'-0" FLAT
BHD 39'-0" OFF ℄ PORT
CONTAM ST GEN BLOW OVBD SEE REF 16
V508 FURN ON REF 16
SHELL
FOR CONT SEE PLAN ABV 60'-0" LVL
H-SWING TYPE CUT 5 3/4" DIA HOLE THRU 60'-0" LVL
FOR CONT SEE PLAN ABV 60'-0" FLAT
ASSY NO. 2
ST TO TK HTG COILS REF 14
FO STORAGE TK REF 7
STEAM TRAP
LOW SULPHUR FO TK REF 7
FOR CONT SEE REF #13
SECT "B-B" LKG FWD
PART PLAN 'G1-G1'
TERMINATE VENT 3' ABV DK DRAIN
FIRE PUMP ROOM ACCESS TRUNK
PART PLAN 'A1-A1'
TERMINATE ABV 33'-0" LVL
DK COAMING
FOR VENT SEE PART PLAN 'A1-A1'
CONN FOR P8-1/2" (F)
FR 52
BHD 39'-0" OFF ℄ SHIP PORT
CONTAM STM GEN OUT CONT ON REF #14
P2AM-3" FOR CONT SEE PLAN
CONTAM STEAM GENERATOR
DRAIN COOLER
V448 SURFACE BLOW FURN W/GEN
V449 BOTTOM BLOW FURN W/GEN
CONN FOR SALINITY CELL (F-48)
P1-4" EXTEND VENT TO 4" ABV 33'-0" FLAT
FURN WITH UNIT
COAMING SEE REF #17
CONT'D ON PLAN BEL 60'0" FLAT FWD
33'-0" FLAT
ELEV "D-D" LKG OUTBD
LOW SULPHUR FO TK
V437 V430 V431 V432
P5AB-1 1/2" P5AC-1 1/2"
H-SWING TYPE W/EX LEG
33'-0" FLAT
FOR CONT SEE PLAN BEL 60'-0" FLAT FWD
SECT "C-C" LKG AFT
FOR CONT SEE PLAN BEL 60'0" LEVEL AFT

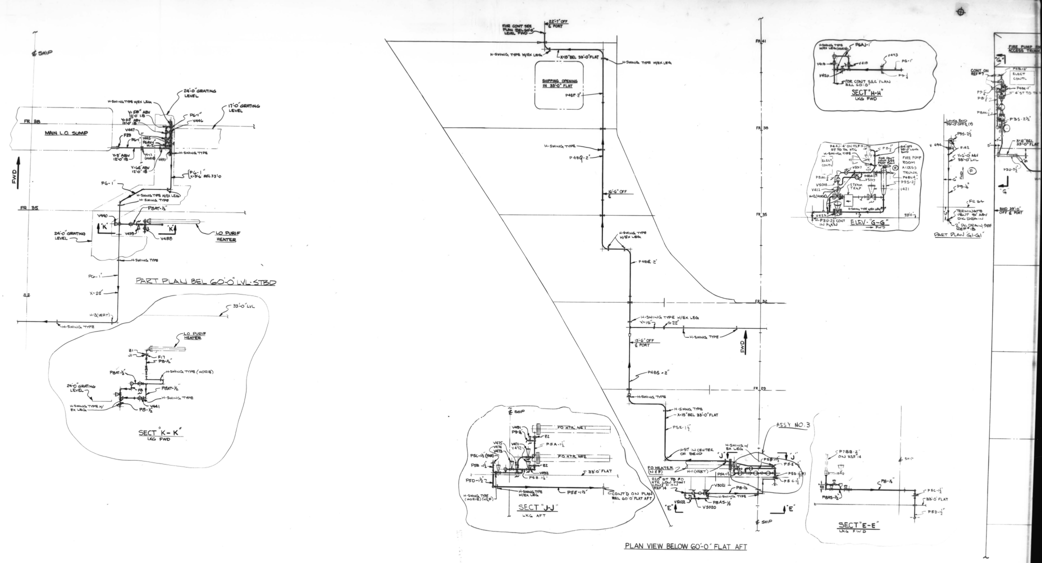
PLAN BELOW 60'-0" FWD

"X" DIMENSIONS ARE TAKEN FROM BELOW 33'-0" FLAT AND
"Y" DIMENSIONS ARE TAKEN FROM ABOVE 33'-0" UNLESS OTHERWISE NOTED

6555-469

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade mark of KEUFFEL & ESSER CO

SEPT. '80
FRAME 3
10X


℄ SHIP
MAIN L.O. SUMP
FR 38
FR 35
24'-0" GRATING LEVEL
17'-0" GRATING LEVEL
H-SWING TYPE W/EX LEG
H-SWING TYPE
P6-1"
V446
V447
F29
V440
V439
V488
LO PURIF HEATER
FWD
PART PLAN BEL 60'-0" LVL-STBD
X=22"
H-13(VERT)
33'-0" LVL
SECT "K-K"
LKG FWD
P8-½"
P8AT-½"
V441
H-SWING TYPE (HORIZ)
FOR CONT SEE PLAN BEL 60'-0" LEVEL FWD
22'-7" OFF ℄ PORT
X-15" BEL 33'-0" FLAT
SHIPPING OPENING IN 33'-0" FLAT
P48P 2"
P48Q-2"
16'-6" OFF ℄
P48R 2"
P48S-2"
13'-6" OFF ℄ PORT
FR 41
FR 38
FR 35
FR 32
FR 29
SECT "J-J"
LKG AFT
FO HTR NO 1
FO HTR NO 2
33'-0" FLAT
P5E-1½"
CONT'D ON PLAN BEL 60'-0" FLAT AFT
FO HEATER (N&F)
ASSY NO. 3
V5021
V5020
V5022
P8A5-½
"E"
"J"
SECT "E-E"
LKG FWD
P7BB-2" ON REF 14
P5C-1½"
P5D-1½"
PLAN VIEW BELOW 60'-0" FLAT AFT
SECT "H-H"
LKG FWD
P6AJ-1"
V418
V419
V420
V493
FOR CONT SEE PLAN BEL 60'-0"
ELEV-"G-G"
FWD
FIRE PUMP ROOM ACCESS TRUNK
STEAM TRAP
V5017
V5018
V5019
V421
V422
V423
P3U-2½" CONT IN PLAN
PART PLAN G1-G1"
FR 34
TERMINATE VENT 5' ABV DK DRAIN
BHD 33'-0" OFF ℄ PORT
FIRE PUMP ACCESS TRUNK
"G"
CONT ON REF #7
ELECT CONTL
P3S-2½"

6555-469

SEPT. '80

FRAME 4

10X

6555-470
613C
614C

CSD VAULT
E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 7-20-8
SIGNED J K Johnson

YARD PRINTS | ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS																								
REV.	F	C	E	E	A	B	C	C	C	A	B	F	A	F	B	A	B	A	A	B	D	C	E	F
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	10A	1A

GROUP
MC NO.

DWG. REV. — HULL APPLIC.

REV.	613C	614C
A	YES	YES
B	YES	YES
C	YES	YES
D	YES	YES
E	YES	YES
F	YES	YES

NNS&DDCO HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C 613C	310 309	T11-S-1162	

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING

ARRANGEMENT DWG Nº 6555-469
PIPE MATERIAL ORDER Nº 6555-471
INSTALLATION GROUP Nº 6555-0106-1201-P1; 6555-0105-1201-P1; 6555-0104-1203-P1; 6555-0104-1103-P1; 6555-0115-1105-P1; 6555-0101-1001-S1; 6555-0118-1001-S1; 6555-0117-1701-P1; 6555-0119-1001-P1

SCALE NONE
DRAWN D.L. HOFFMAN
CHECKED H.M. EDGE
SECT. MGR. J K Johnson
DATE COMPL. 1-6-77
EXAMINED
AUTHORIZED E E Stephenson
DATE 1-6-77
TECH. APPROVAL NOT REQ'D
CSD APPROVAL R. L. Warrington

GROUPED BY CHK. | DATES COMP. PART | HULL 613C GROUP NO. KEY
TYPE OF DWG. ———

TITLE PIPING ARR CONTAM. STEAM DRAIN SYS - ENG RM LIST OF MATERIAL

DWG. NO. 6555 - 470 REV F SHEET NO. 1 OF 22

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE	1/6/77		—	—
B	2	DELETED L'S 3&4. ADDED L'S 5,6,13&14.				
	3	DELETED L'S 1-3. ADDED L'S 4-8 12&13.				
	4	DELETED L.1 ADDED L'S 12-14				
	6	ADDED L'S 14-16.				
	7 8	DELETED L'S 5 & 16-18. SHT 8; ADDED L'S 15 & 16				
	9	ADDED L'S 12-19.				
	11	ADDED L.12.				
	12	DELETED LINES 3,4 12,13 & 17&18				
	14	ADDED LINES 14-15.				
	15	ADDED LINES 13 & 14.				
	17	DELETED LINE 4				
	20	ADDED LINE 14				
	21	ADDED LINE 7				
	22	ADDED SHT 22	7/1/7		—	—
C	2,22, 12,7,8 9	MATL LIST UPDATED	8/2/7		—	—
D	21	DELETED LINE 3 & ALT'D LINE 12 QTY WAS 3	1/12/8		—	
E	3	DELETED LINE NO. 7.				
	4	QTY OF L.9 WAS 48". ADDED L'S 15, 17 & 18				
	10A	ADDED SHT NO. 10A				
	15	ADDED LINE NO. 15.				
		THE ABOVE WORK ACCOMP ON 613C	7/20/8		—	—
F	12	ADDED LINE 19.			—	—

NOTES

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF #1

NO.	REFERENCES	DWG. NO.
1	DIAGRAM CONTAM STM GEN SYS — LIST OF MATL	6450-693

HULL NO. 613C, 614C DWG. NO. 6555-470 SHEET 1A OF

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	PSD	1½" IPS x STD STL PIPE	PIPE DET 6555-471	PS	
	2	1	PSE				
B	3	~~1~~	~~PSF~~				
B	4	~~1~~	~~PSG~~	↓	↓		
B	5	1	P4BR	2" IPS x STD STL PIPE	PIPE DET 6555-471	PS	
B	6	1	P4BS	↓	↓	↓	
	7						
	8						
	9						
	10						
	11		FITTING Nº				
	12	6	H13	1½" HANGER SINGLE LEG SWING TYPE	S 25-48-366	ST-PS	
B	13	1	H-57	1½" SWING TYPE HANGER	MO 283176 S.24 L.7		
B	14	5	H-11	1½ SWING TYPE HANGER W/EX LEG	S/ 25-46-366	↓	
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - CONTAM STM DR SYS
GROUP NO. PS-157 6555-0106-1201 P1 SHT 1 OF 1
APPLICABLE HULLS 613C 614C
DWG NO. 6555-470 SHEET 2 REV. C

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	~~1~~	~~P5H~~	~~1½" IPS x STD STL PIPE~~	PIPE DET 6555-471	PS	
B	2	~~1~~	~~P5J~~				
B	3	~~1~~	~~P5K~~	↓	↓		
B	4	1	P4BQ	2" IPS x STD STL PIPE	PIPE DET 6555-471		
B	5	1	P4BP				
B	6	1	P4BH				
E	7	~~1~~	~~P4BT~~	↓	↓	↓	
	8						
	9						
	10		FITTING Nº				
	11	4	H13	1½" HANGER, SINGLE LEG SWING TYPE	S/ 25-48-366	ST-PS	
B	12	3	H-11	2" SWING TYPE HGR W/EX LEG	S/ 25-46-576		
B	13	2	H-11	2" SWING TYPE HGR	S/ 25-46-376	↓	
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - CONTAM STM DR SYS
GROUP NO. PS 159 6555-0105-1201-P1 SHT 1 OF 1
APPLICABLE HULLS 613C 614C
DWG NO. 6555-470 SHEET 3 REV. E

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B	1	~~1~~	~~P5L~~	~~1½" IPS x STD STL PIPE~~	PIPE DET 6555-471	PS	
	2	1	P3S	2½"			
	3	1	P3T				
	4	1	P3U	↓			
	5	1	P2V	3"	↓		
	6	1	P6AN	1" ↓	MO 6555-566 SH 4 L1		
	7	41'-0"	P6	1" IPS x STD STL PIPE	S 57-06-104		
	8	10'-0"	P8	½" IPS x"x"HVY. STL PIPE	57-07-102		
E	9	20'-0"	P9	¼"	57-07-100		
	10	24'	P7	¾"	57-07-103		
	11	1	P8AK	½" ↓	MO 6555-566 S5 L1		
B	12	1	P4BG	2" IPS x STD STL PIPE	PIPE DET 6555-471		
B	13	1	P4BK				
B	14	1	P4BL	↓	↓	↓	
E	15	1	P3BT	2½" IPS x STD STL PIPE	PIPE DET 6555-471	PS	
	16						
E	17	2	F-42	¼" UNION THD. C.S	S/ 25-12-190	ST-PS	
E	18	3	H-11	¼" SWING TYPE HGR	S/ 25-47-304	↓	

REMARKS -

SERVICE - CONTAM STM DR SYS
GROUP NO. PS 157 6555-0104-1203 P1 SHT 1 OF 3
APPLICABLE HULLS 613C 614C
DWG NO. 6555-470 SHEET 4 REV. E

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V418	1" GLOBE STOP SW 600# STL	FURN WITH PIPE DET ON 6555-471	PS	
	2	1	V419	1" GATE STL SW 600#			
	3	1	V420	1" GLOBE STOP SW 600# STL			
	4	1	V421	2½" GLOBE STOP FLG'D 150# STL			
	5	1	V422	2½" GATE FLG'D 150# STL			
	6	1	V423	2½" GLOBE STOP FLG'D 150# STL	↓		
	7	1	V493	¼" GLOBE STOP SW 600# STL	PO ① 6450-C9	MD-PS	
	8	1	V494	¼"	↓		
	9	1	V5017	½"	FURN WITH PIPE DET ON 6555-471	PS	
	10	1	V5018	½"			
	11	1	V5019	½" ↓	↓		
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - CONTAM STM DR SYS
GROUP NO. PS 157 6555-0104-1203-P1 SHT 2 OF 3
APPLICABLE HULLS 613C 614C
DWG NO. 6555-470 SHEET 5 REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	FITTING Nº.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	2	F20	1" COUPLING STL SW 3000#	S 25-60-054	ST-PS	
	2	1	F21	1"x1"x¼" TEE STL SW 3000#	S 25-60-237		
	3	3	F26	2½" BACKING RING STL SCH 40	S 97-18-124		
	4						
	5						
	6						
	7						
	8						
	9	3	H13	3" HANGER SINGLE LEG SWING TYPE W/LINER	S/ 25-48-396	ST-PS	
	10	4	H13	2½"	S/ 25-48-386		
	11	5	H13	1"	S/ 25-48-346		
	12	3	H13	½"	S/ 25-48-326		
	13	1	H13	¼" ↓	S 25-48-314		
B	14	1	H-11	2" SWING TYPE HGR W/EX LEG	S/ 25-46-376		
B	15	1	H-11	2" SWING TYPE HGR	↓		
B	16	2	H-12	2" SWING TYPE HGR	S/ 25-47-376	↓	
	17						
	18						

REMARKS -

SERVICE - CONTAM STM DR SYS
GROUP NO. PS 157 6555-0104-1203 P1 SHT 3 OF 3
APPLICABLE HULLS 613C 614C
DWG NO. 6555-470 SHEET 6 REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P2W	3" IPS x STD STL PIPE	PIPE DET 6555-471	PS	
	2	1	P2X	3"			
	3	1	P3Y	2½"			
	4	1	P3Z	2½"			
B	5	~~1~~	~~P3AA~~	~~2½"~~			
	6	1	P5AB	1½"			
	7	1	P5AC	1½"			
C	8	~~1~~	~~P4AD~~	~~2"~~			
C	9	~~1~~	~~P4AF~~	~~2"~~	↓		
C	10	80'-0"	P10	1" X-HVY	S 57-07-104		
	11	27'-0"	P6	1" STD ↓	S 57-06-104		
	12	24"	P7	¾" IPS x"x"HVY STL PIPE	S 57-07-103		
	13	48"	P8	½" IPS x"x"HVY STL PIPE	S 57-07-102		
	14	36"	P9	¼"	S 57-07-100		
	15	1	P8AH	½" ↓	MO 6555-566 S3 L1		
B	16	~~1~~	~~P5M~~	~~1½" IPS x STD STL PIPE~~	—		
B	17	~~1~~	~~P5N~~	~~1½"~~	—		
B	18	~~1~~	~~P5P~~	~~1½"~~ ↓	—		

REMARKS -

SERVICE - CONTAM STM DR SYS
GROUP NO. PS-157 6555-0104-1103 P1 SHT 1 OF 4
APPLICABLE HULLS 613C 614C
DWG NO. 6555-470 SHEET 7 REV. C

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V427	2½" GLOBE STOP FLG'D 150# STL	FURN WITH PIPE DET ON 6555-471	PS	
	2	1	V428	2½" GATE FLG'D 150# STL			
	3	1	V429	2½" GLOBE STOP FLG'D 150# STL			
	4	1	V430	1½" GLOBE STOP SW 600# STL			
	5	1	V431	1½" GATE SW 600# STL			
	6	1	V432	1½" GLOBE STOP SW 600# STL	↓		
	7	1	V496	¼"	PO ① 6450-C9	MD-PS	
	8	1	V497	¼"	↓		
	9	1	V5023	½"	FURN WITH PIPE DET. ON 6555-471	PS	
	10	1	V5024	½"			
	11	1	V5025	½" ↓	↓		
C	12	1	J11	2" FLANGE 150# S.W. STL.	S 25-18-845	ST PS	
C	13	1	F41	2"x1" INSERT RED. STL. S.W.	S 25-60-384		
	14		ITEM Nº				
B	15	1	—	ASSY NO. 2 CONSISTING OF;			
B	16	1	P3AA	2½" IPS x STD STL PIPE	PIPE DET 6555-471	PS	
	17						
C	18	6	F20	1" COUPLING STL S.W.	S 25-60-054	ST-PS	

REMARKS -

SERVICE - CONTAM STM DR SYS
GROUP NO. PS 157 6555-0104-1103-P1 SHT 2 OF 4
APPLICABLE HULLS 613C 614C
DWG NO. 6555-470 SHEET 8 REV. C

6555-470

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
® Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80
FRAME
8X

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	4	F26	2½" BACKING RING STL SCH 40	S 97-18-124	ST-PS	
		2	2	F27	3"	S 97-18-126	↓	
		3	2	F20	1" COUPLING STL SW 3000#	S 25-60-054	↓	
		4	2	H13	3" HANGER SWING TYPE SINGLE LEG	S 25-48-396	↓	
		5	3	H13	2½"	S 25-48-386	↓	
		6	2	H13	2"	S 25-48-376	↓	
		7	2	H11	2"	S 25-46-376	↓	
		8	3	H13	1½	S 25-48-366	↓	
		9	2	H11	1½"	S 25-46-366	↓	
C		10	14	H11	1"	S 25-46-346	↓	
		11	2	H13	½"	S 25-48-326	↓	
B		12	2	H-11	2½ SWING TYPE HANGER W/EX LEG	S/ 25-46-386	↓	
B		13	2	H-11	2½ SWING TYPE HANGER	S/ 25-46-386	↓	
B		14	1	H-12	2½ SWING TYPE HANGER W/EX LEG	S/ 25-47-386	↓	
B		15	3	H-11	2" SWING TYPE HANGER W/EX LEG	S/ 25-46-376	↓	
B		16	1	H-57	2" SWING TYPE HANGER	MO 283176 5.15 L.F	↓	
B		17	1	P4BF	2" IPS X STD THK STL PIPE	PIPE DET 6555-471	PS	
B		18	1	P4BM	↓	↓	↓	
B		19	1	P4BN	↓	↓	↓	

REMARKS -

SERVICE - CONTAM STM DR SYS

PS 157

GROUP NO.

6555-0104-1103-PI SHT 3 OF 4

APPLICABLE HULLS 613C 614C

DWG NO. 6555-470 SHEET 9 REV. C

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	4	Z3	2" 150#	BOLTS	⅝" HVY HEX HD STL L=2½"	PO 6000-C7 ㉗	MD-PS	
	2	4			NUTS	⅝" HVY HEX STL	PO 6000-C12 ⑱	↓	
	3	1			GSKT	1/16" THK COMPR ASBESTOS	S 15-01-270E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - CONTAM STM DR SYS

PS 157

GROUP NO.

6555-0104-1103 PI SHT 4 OF 4

APPLICABLE HULLS 613C 614C

DWG NO. 6555-470 SHEET 10 REV. A

GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	10'-0"	P-9	¼" IPS X X-HVY PIPE STL	S/ 57-07-100	ST-PS	
		2						
		3	2	F-42	¼" UNION THD C.S.	S/ 25-12-190	ST-PS	
		4	2	H-11	¼" SWING TYPE HGR	S/ 25-47-304	↓	
		5						
		6						
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - CONT STM DR SYS

GROUP NO.

6555-0104-1103-PI

APPLICABLE HULLS 613C 614C

DWG NO. 6555-470 SHEET 10A REV. E

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2AL	3" IPS x STD THK STL PIPE	PIPE DET 6555-470	PS	
		2	26'-0"	P6	1"	S 57-06-104	↓	
		3						
		4						
		5						
		6						
		7						
		8		FITTING No				
		9	1	F20	1" COUPLING STL SW 3000#	S 25-60-054	ST-PS	
		10	2	H13	3" HANGER SWING TYPE SINGLE LEG	S 25-48-396	↓	
		11	2	H13	1"	S 25-48-346	↓	
B		12	1	H-11	3" SWING TYPE HGR W/EX LEG	S/ 25-46-396	↓	
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - CONTAM STM DR SYS

PS 161

GROUP NO.

6555-0115-1105 PI SHT 1 OF

APPLICABLE HULLS 613C 614C

DWG NO. 6555-470 SHEET 11 REV. B

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2AM	3" IPS X STD THK STL PIPE	PIPE DET 6555-471	PS	
		2	1	P2AN	3"	↓	↓	
B		3	~~1~~	~~P5Q~~	~~1½"~~	↓	↓	
B		4	~~1~~	~~P5R~~	~~1½"~~	↓	↓	
C		5	~~1~~	~~P4AG~~	~~2"~~	↓	↓	
		6	1	P1AR	4"	↓	↓	
		7	1	P8AP	½" IPS X X-HVY THK STL PIPE	MO 6555-566 S6 L1	↓	
		8	33'-0"	P8	½"	S 57-07-102	↓	
		9	1	P6AQ	1" IPS X STD THK STL PIPE	MO 6555-566 S7 L1	↓	
		10	91'-0"	P6	1"	S 57-06-104	↓	
		11	24"	P9	¼" IPS x "X"-HVY THK STL PIPE	S 57-07-100	↓	
B		12	~~1~~	~~P5A~~	~~1½"~~ IPS X STD THK STL PIPE	PIPE DET 6555-471	↓	
B		13	~~1~~	~~P5B~~	~~1½"~~	↓	↓	
		14	1	P5C	1½"	↓	↓	
		15	1	P8AS	½" IPS x "X" HVY STL PIPE	MO 6555-566 S8 L1	↓	
		16	1	P8AT	½"	MO 6555-566 S9 L1	↓	
B		17	1	P6AV	1" STD IPS PIPE STL	MO 6555-566 S10 L1	↓	
B		18	1	P1BJ	4" IPS x STD THK STL PIPE	PIPE DET 6555-471	↓	
F		19	48"	P4	2" IPS x STD THK STL PIPE	S/57-06-107		

REMARKS -

SERVICE - CONTAM STM DR SYS

PS 161

GROUP NO.

6555-0101-1001-SI SHT 1 OF 5

APPLICABLE HULLS 613C 614C

DWG NO. 6555-470 SHEET 12 REV. F

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	VALVE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V5026	½" GLOBE STOP SW 600# STL	FURN WITH PIPE DET ON	PS	
		2	1	V5027	½"	↓	↓	
		3	1	V5028	½"	↓	↓	
		4	1	V424	1"	↓	↓	
		5	1	V425	1" GATE SW 600# STL	↓	↓	
		6	1	V426	1" GLOBE STOP SW 600# STL	↓	↓	
		7	1	V488	¼" GLOBE STOP SCR'D 250# BRONZE	↓	↓	
		8	1	V490	¼"	↓	↓	
		9	1	V491	¼" GLOBE STOP SW 600# STL	PO ① 6450-C9	MD-PS	
		10	1	V492	¼"	↓	↓	
		11	1	V493	¼"	↓	↓	
		12	1	V439	½" GLOBE STOP SCR'D 250# BRONZE	FURN WITH PIPE DET ON	PS	
		13	1	V440	½" GATE SCR'D 250# BRZ	↓	↓	
		14	1	V441	½" GLOBE STOP SCR'D 250# BRONZE	↓	↓	
		15	1	V445	1"	↓	↓	
		16	1	V446	1" GATE SCR'D 250# BRZ	↓	↓	
		17	1	V447	1" GLOBE STOP SCR'D 250# BRONZE	↓	↓	
		18						

REMARKS -

SERVICE - CONTAM STM DR SYS

PS 161

GROUP NO.

6555-0101-1001-SI SHT 2 OF 5

APPLICABLE HULLS 613C 614C

DWG NO. 6555-470 SHEET 13 REV. A

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	VALVE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V471	1½" GLOBE STOP SW 600# STL	FURN WITH PIPE DET ON	PS	
		2	1	V472	1½"	↓	↓	
		3	1	V473	1½"	↓	↓	
		4	1	V474	1½" GATE SW 600# STL	↓	↓	
		5	1	V475	1½" GLOBE STOP SW 600# STL	↓	↓	
		6	1	V5020	½"	↓	↓	
		7	1	V5021	½"	↓	↓	
		8	1	V5022	½"	↓	↓	
		9						
		10						
		11						
		12		ITEM No				
B		13	1	—	ASSY NO. 3 CONSISTING OF:			
B		14	1	P5A	1½ IPS x STD THK STL PIPE	PIPE DET 6555-471	PS	
B		15	1	P5B	↓	↓	↓	
		16						
		17						
		18						

REMARKS -

SERVICE - CONTAM STM DR SYS

PS 161

GROUP NO.

6555-0101-1001-SI SHT 3 OF 5

APPLICABLE HULLS 613C 614C

DWG NO. 6555-470 SHEET 14 REV. B

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	2	F18	½" UNION STL SW	PO ② 6950-C11	MD-PS	
		2	4	F20	1" COUPLING STL SW 3000#	S 25-60-054	ST-PS	
		3	3	F26	3" BACKING RING STL SCH 40	S 97-18-126	↓	
		4	2	H13	3" HANGER SWING TYPE SINGLE LEG	S/ 25-48-396	↓	
		5	4	H13	1½	S/ 25-48-366	↓	
		6	11	H13	1"	S/ 25-48-346	↓	
		7	6	H13	½"	S/ 25-48-326	↓	
		8	1	F17	¾" X ½" INSERT RED STL SW 3000#	S 25-60-364	↓	
		9	1	J1	½ FLANGE S.W. STL 150#	S 25-18-840	↓	
		10	1	F16	1" X ½" X 1" TEE STL SW 3000#	PO ⑭ 6555-C8	MD-PS	
		11	2	F28	½" COUPLING STL SW 3000#	S 25-60-052	ST-PS	
		12	1	F29	2" X 1"	PO ⑮ 6555-C8	MD-PS	
B		13	1	H-11	3" SWING TYPE HANGER W/EX LEG	S/ 25-46-396	ST-PS	
B		14	1	H-11	2" SWING TYPE HANGER W/EX LEG	S/ 25-46-376	↓	
E		15	1	F-43	SALINITY CELL	PO (168) 6755-M1	ST-PS	
		16						
		17						
		18						

REMARKS -

SERVICE - CONTAM STM DR SYS

PS 161

GROUP NO.

6555-0101-1001 SI SHT 4 OF 5

APPLICABLE HULLS 613C 614C

DWG NO. 6555-470 SHEET 15 REV. E

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	16	Z4	4" 150#	BOLTS	⅝" HVY HEX HD STL L=3"	PO 6000-C7 ㉕	MD-PS	
	2	16			NUTS	⅝" HVY HEX STL	PO 6000-C12 ⑱	↓	
	3	2			GSKT	1/16" THK COMP ASBESTOS	S 15-01-278E	ST-PS	
	4	8	Z2	1½" 150#	BOLTS	½" HVY HEX HD STL L=2¼"	PO 6000-C7 ㉛	MD-PS	
	5	8			NUTS	½" HVY HEX STL	PO 6000-C11 ①	↓	
	6	2			GSKT	1/16" THK COMP ASBESTOS	S 15-01-268E	ST-PS	
	7	4	Z1	¾" 150#	BOLTS	½" HVY HEX HD STL L=2"	PO 6000-C7 ⑫	MD-PS	
	8	4			NUTS	½" HVY HEX STL	PO 6000-C11 ①	↓	
	9	1			GSKT	1/16" THK COMP ASBESTOS	S 15-01-262E	ST-PS	
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - CONTAM STM DR SYS

PS 161

GROUP NO.

6555-0101-1001-SI SHT 5 OF 5

APPLICABLE HULLS 613C 614C

DWG NO. 6555-470 SHEET 16 REV. A

6555-470

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

6555-470

MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
Registered trademark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	85'-0"	P6	1" IPS X STD THK STL PIPE	S 57-06-104	PS	
		2	100'-0"	P8	1/2" IPS X"X" HVY STL PIPE	S 57-07-102		65' 30
		3	1	P5AU	1 1/2" IPS X STD THK STL PIPE	PIPE DET 6555-471		
B		4	~~1~~	~~P4AV~~	~~2"~~			
		5	1	P8AW	1/2" IPS X"X" HVY STL PIPE	MO 6555-566 S 11 L1		
		6	1	P6AX	1" IPS X STD THK STL PIPE	MO 6555-566 S 12 L1		
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - CONTAM STM DR SYS

PS 173

									GROUP NO.		6555-0118-1001-SI SHT 1 OF 3
APPLICABLE HULLS	613C	614C									DWG NO. 6555-470
SHEET	17	REV.	B								

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	2	F1	1/2" BHD SLEEVE STL WELDED	S 25-20-386	ST-PS	
		2	1	F12	1"	S 25-20-388		
		3	1	F11	1"X 1/2" X1" TEE STL SW 3000#	PO ⑭ 6555-C8	MD-PS	
		4	2	F9	1" 90° ELL STL SW 3000#	S 25-60-008	ST-PS	
		5	6	F20	1" COUPLING	S 25-60-054		
		6	5	F26	1/2"	S 25-60-052		
		7	1	F5	1"X1"X 1/2" TEE	PO ⑯ 6555-C8	MD-PS	
		8						
		9	8	H13	1/2" HANGER SWING TYPE SINGLE LEG	S/ 25-48-326	ST-PS	
		10	8	H-13	1"	S/ 25-48-346		
		11	1	H-13	1 1/2	S/ 25-48-366		
		12	1	H-13	2"	S/ 25-48-376		
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - CONTAM STM DR SYS

PS 173

									GROUP NO.		6555-0118-1001-SI SHT 2 OF 3
APPLICABLE HULLS	613C	614C									DWG NO. 6555-470
SHEET	18	REV.	A								

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	V436	1" GLOBE STOP SCR'D 250# BRONZE	FURN WITH PIPE DET ON 6555-471	PS	
		2	1	V437	1" GATE SCR'D 250# BRZ			
		3	1	V438	1" GLOBE STOP SCR'D 250# BRONZE			
		4	1	V442	2" GLOBE STOP SCR'D 250# BRONZE			
		5	1	V443	2" GATE SCR'D 250# BRZ			
		6	1	V444	2" GLOBE STOP SCR'D 250# BRONZE			
		7	1	V489				
		8	1	V5029	1/2" GLOBE STOP SCR'D 250# BRONZE			
		9	1	V5030	1/2"			
		10	1	V5031	1/2"			
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - CONTAM STM DR SYS

PS 173

									GROUP NO.		6555-0118-1001-SI SHT 3 OF 3
APPLICABLE HULLS	613C	614C									DWG NO. 6555-470
SHEET	19	REV.	A								

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P3AY	2 1/2" IPS X STD THK STL PIPE	PIPE DET 6555-471	PS	
		2	1	P3AZ	2 1/2"			
		3	1	P3BA	2 1/2"			
		4	1, 2	P2BB	3"			
		5	1	P2BC	3"			
		6						
		7						
		8		FITTING Nº				
		9	7	F26	2 1/2" BACKING RING STL SCH 40	S 97-18-124	ST-PS	
		10	2	F27	3"	S 97-18-126		
		11						
		12	5	H13	2 1/2" HANGER SWING TYPE SINGLE LEG	S 25-48-386	ST-PS	
		13	3	H13	3"	S/ 25-48-396		
B		14	1	H-11	3" SWING TYPE HANGER W/EX LEG	S/ 25-46-396		
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - CONTAM ST DR SYS

PS 164

									GROUP NO.		6555-0117-1101-P1 SHT 1 OF 1
APPLICABLE HULLS	613C	614C									DWG NO. 6555-470
SHEET	20	REV.	B								

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P4BD	2" IPS X STD THK STL PIPE	PIPE DET 6555-471	PS	
		2	20'-0"	P1D	1 1/4"	S 57-06-105		
B		3	~~72'-0"~~	~~P7~~	~~3/4" IPS X"X" HVY STL PIPE~~	~~S~~ ~~57-07-103~~		
		4	50'-0"	P8	1/2"	S 57-07-102		
		5	1	P4BE	2" IPS X STD THK STL PIPE	PIPE DET 6555-471		
		6		FITTING Nº				
B		7	2	H-11	2" SWING TYPE HANGER W/EX LEG	S/ 25-46-376	ST-PS	
		8	1	F3D	1 1/4" BHD SLEEVE STL WELDED	S 25-20-389	ST-PS	
		9	1	F1	1/2"	S 25-20-386		
		10	1	F8	1/2" 90° ELL STL SW 3000#	S 25-60-006		
		11	4	F26	1/2" COUPLING STL SW 3000#	S 25-60-052		
D		12	1	F4	3/4" 90° ELL STL SW 3000#	S 25-60-007		
		13	1	F10	3/4" BHD SLEEVE STL SW WELDED	S 25-20-387		
		14	3	F31	3/4" COUPLING STL SW 3000#	S 25-60-053		
		15	6	H13	1/2" HANGER SWING TYPE SINGLE LEG	S/ 25-48-326		
		16	10	H13	3/4"	S/ 25-48-336		
		17	2	H13	1 1/4	S/ 25-48-356		
		18	3	H13	2"	S/ 25-48-376		

REMARKS -

SERVICE - CONTAM ST DR SYS

PS 155

									GROUP NO.		6555-0119-1001-PI SHT 1 OF 1
APPLICABLE HULLS	613C	614C									DWG NO. 6555-470
SHEET	21	REV.	D								

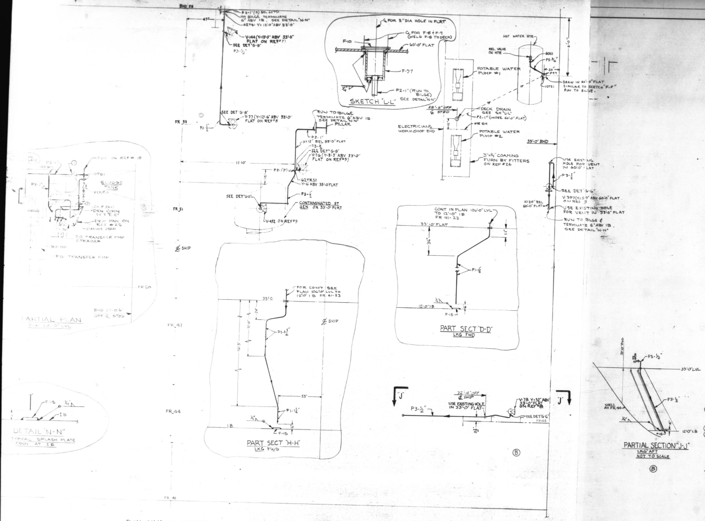
GROUP

REV.		LINE NO.	QTY (1 SHIP)	HANGER Nº	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	TR-1	2" TIE ROD ASSY	MO 283135 S. L.	ST-PS	
		2	6	H-11	1/2" SWING TYPE HGR W/EX LEG	S/ 25-46-326		
		3	9	H-11	1" SWING TYPE HGR W/EX LEG	S/ 25-46-346		
		4	3	H-12	1" SWING TYPE HGR	S/ 25-47-346		
		5	2	H-57	1/2 SWING TYPE HGR	MO 283176 S.31 L4		
		6	1	H-11	1 1/4" SWING TYPE HGR W/EX LEG	S/ 25-46-356		
		7	1	H-11	3/4" SWING TYPE HGR W/EX LEG	S/ 25-46-336		
		8	1	H-57	3/4" SWING TYPE HGR	MO 283135 S.2 L.5		
		9	2	H-57	1" SWING TYPE HGR	MO 283176 S. 22 L7		
		10	2	H-12	1/2" SWING TYPE HGR	S/ 25-47-326		
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - CONTAM ST DR SYS.

									GROUP NO.		6555-0119-1001-PI SHT 2
APPLICABLE HULLS	613C	614C									DWG NO. 6555-470
SHEET	22	REV.	C								


BHD F8
P2-1"(P) BEL 62TSI
TO BILGE TERMINATE 6" ABV IB, SEE DETAIL "N-N"
62TSI Y=12'-0" ABV 33'-0"
47"
V-144 (Y=13'-5" ABV 33'-0" FLAT ON REF#7)
SEE DET "G-G"
P3-½"
℄ FOR 3" DIA HOLE IN FLAT
℄ FOR F-8 & F-9 (WELD F-8 TO DECK)
F-10
60'-0" FLAT
F-97
¼"
P2-1" (RUN TO BILGE) SEE DETAIL "N-N"
SKETCH "L-L"
HOT WATER HTR
REL VALVE ON HTR
60UI
P5-¾"
20"
F97
6'-0"
DRAIN IN 60'-0" FLAT SIMILAR TO SKETCH "F-F" RUN TO BILGE.
10TSI
POTABLE WATER PUMP #1
28'-8" OFF ℄ STBD
DECK DRAIN SEE SK "L-L"
P2-1" (UNDER 60'-0" FLAT)
FR 54
ELECTRICIANS WORKSHOP BHD
POTABLE WATER PUMP #2
3"x¼" COAMING FURN BY FITTERS ON REF #24
39'-0" BHD
SEE DET "G-G"
V-77 (Y=12'-6" ABV 33'-0" FLAT ON REF#8
FR 54
P3-½"
RUN TO BILGE TERMINATE 6" ABV IB SEE DETAIL "N-N"
PILLAR
P2-1"
X=12" BEL 33'-0" FLAT
P3-½
SEE DET "G-G"
V-76 (Y=3'-3" ABV 33'-0" FLAT ON REF#9)
11'-10"
P2-1"(P)
18"
62TRSI
Y=6" ABV 33'-0" FLAT
SEE DET "G-G"
P3-½"
CONTAMINATED ST GEN ON 33'-0" FLAT
V-452 ON REF#9
FR 51
USE EXISTING HOLE FOR VENT IN 60'-0" FLAT
P3-½"
SEE DET "G-G"
V-397 (Y=5'9" ABV 60'-0" FLAT ON REF 9
X=24" BEL 60'-0" FLAT
USE EXISTING HOLE FOR VENT IN 33'-0" FLAT
RUN TO BILGE & TERMINATE 6" ABV IB. SEE DETAIL "N-N"
P2-1" ON REF # 10
P2-1"
10TSI
P2-1"
SLUDGE TANK
REF #10
DRIP PAN
DEN CONN DET "E-E"
DRIP PAN ON REF #25
STRAINER DRAIN
F.O. TRANSFER PMP STRAINER
DRIP PAN
F.O. TRANSFER PMP
FR 50
BHD 27'-0¾" OFF ℄ STBD
PARTIAL PLAN
BLW 33'-0" LVL
℄ SHIP
CONT IN PLAN 106'-0" LVL TO 12'-0" IB FR 41-23
33'-0" FLAT
36"
11"
P1-1¼"
¼"
12'-0" IB
6"
F-15
PART SECT "D-D"
LKG FWD
FOR CONT SEE PLAN 106'-0" LVL TO 12'-0" IB FR 41-23
33'-0"
24"
11'-0"
16'-3"
P1-1¼"
℄ SHIP
53"
P1-1¼"
¼"
I.B.
6"
F-15
PART SECT "H-H"
LKG FWD
FR 47
FR 44
F-15
¼"
IB
DETAIL "N-N"
TYPICAL SPLASH PLATE CONN AT IB
"J"
32'-4" OFF ℄ SHIP
USE EXISTING HOLE IN 33'-0" FLAT
P3-½"
V-78 Y=32" ABV 33'-0" FLAT ON REF #8
SEE DET "G-G"
FR 44
"J"
Ⓑ
FR 41
39'-0" BHD
P3-½"
33'-0" LVL
SHELL AT FR 44
P3-½"
¼"
6"
F-15
12'-0" I.B.
PARTIAL SECTION "J-J"
LKG AFT
NOT TO SCALE
Ⓑ

PLAN 106'-0" LVL TO 12'-0" I.B. FR 41 TO 58

REVISIONS

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
A	ALL	INITIAL ISSUE	7/23/76	[illegible]	—	—
B	—	ADDED - IN PLAN, FR47 TO FR49 PORT SIDE, DRAIN FROM 52'-6" FLR PLT (DRIP PAN). ADDED SEC "J-J"				
	—	ALTERED - IN PLAN, FROM FR 44 TO 58, STBD SIDE, AND SECT "B-B", DRAIN FROM V-78 RERUN DIRECTLY TO BILGE. ALTERED PENETRATION INFO WHERE DRAIN FROM BOILER WTR TEST CABINET PASSES THROUGH 60'-0" FLAT.	6/17/77	[illegible]	—	—
C	—	ADDED DECK DRAIN FOR POTABLE WATER PMPS. ADDED DRAINS FOR MN FEED PMPS ALTERED DRAIN UNDER SEWAGE COMMINUTOR	8/31/77	[illegible]	—	—
D	—	ADDED SKETCH "F-F", ADDED DRAINS OFF BED PLATES OF MN FEED PUMPS. ADDED REF #23.			—	—
		ADDED DR LINES FROM FO PMPS #1 & #2 TO SLUDGE TANK. ADDED PARTIAL PLAN BLW 33'-0" LVL. ADDED SPLASH PLATES ON ALL LINES TO IB. ADDED DETAIL "N-N" ADDED REF #24 & 25				
		ADDED PARTIAL PLAN OF 60'-0" LVL				
		ADDED PARTIAL PLAN OF 78'-4" FLAT TO IB. ADDED REF #26	12/20/77	[illegible]	—	—
E	—	RAISED FUNNELS TO 9" MIN ABV FLATS. ADDED 1¼" DRAIN FOR COAMING AROUND 4TH & 5TH STG FEED HEATERS (60'-0" LVL)	7/5/78	AC	—	—
F	—	ADDED DECK DRAIN IN 60'-0" LVL BY BOILER WTR TEST CABINET (WORK ACCOMP ON 613C)	9/7/78	[illegible]		
G	—	ALT'D V-144, V77, V76 & V452 WERE SHOWN BEING ON REF 4, 5, 8 & 8 RESP. LAM				
		ADDED PARTIAL PLAN OF 60'-0" FLAT. & SECT "Q-Q". DRAINS FOR AUX DIESEL GEN. AIR BOX CONN. GER	10/26/78	[illegible]		
H	—	PLAN 106'-0" LVL TO 12'-0" I.B. FR 41-23; DELETED F98 & F99, ADDED F104 & F105. MADE NOTE TO REF #27				
	1A	ADDED REFERENCE #27				
	—	ADDED ADDITIONAL DRAIN FOR 4TH + 5TH STG FD HTR DECK COAMING.	4/27/79	[illegible]		
		(WORK ACCOMPLISHED ON 613C)				

AUTHORITY:

GENERAL NOTES:

[redacted]

13. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOW: BUTT WELDS TYPE P-3, SOCKET WELDS TYPE P-14, AND FLANGE WELDS TYPE P-16A ON REFERENCE 3 EXCEPT AS OTHRWISE INDICATED.
14. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY AND MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
15. PIPE HANGERS ARE TO BE IN ACCORDANCE WITH REFERENCE #14 UNLESS OTHERWISE NOTED.
16. PIPE HANGERS SHOWN IN LIST OF MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH REF 14 UNLESS NOTED ON PLAN.

FOR LIST OF MAT'L SEE NN DWG NO 6555-473

REVISION APPLICABILITY			
REV	N.N. HULL NO. 613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	YES
E	YES	YES	YES
F	YES	YES	NO
G	YES	YES	NO
H	NO	YES	NO

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 4/25/79 SIGNED J. N. Johnson

FIRST ISSUE	DEPT.	NO. PRTS	REV	DATE ISSUED	SPECIAL PRINTS
			A	[illegible]	
			B	[illegible]	
			C	[illegible]	
			D	[illegible]	
			E	[illegible]	
			F	[illegible]	
			G	[illegible]	
			H	[illegible]	

YARD PRINTS
ORDERED BY DESIGN
GROUP:
MC NO.

NO.	REFERENCES	DWG NO.
27 Ⓗ	PIPING ARR - TURB GLAND LEAKOFF SYS - PLAN	6450-700
26	PIPING ARR DIESEL GEN LO FILL PLAN, SECT & ELEV	4002-72
25	ARR OF FLR PLS, GRTGS, & LADDERS BLW 33'-0" LVL-ER	6650-232● 6650-233▲
24	COAMINGS IN 33'-0", 60'-0", & 78'-4" FLATS IN ER.	[illegible]● [illegible]▲
23 Ⓓ	PIPING ARR S.W. COOLING FOR EQUIP ABV 33'-0" FLAT E.R	6550-491● 6550-490▲
22 Ⓑ	PIPING ARR - OIL/WTR SEP FOR BILGE SYS & BAL WTR SAMPLE - ER	2280-715
21	ARR BILGE & BALLAST SYS E.R.	2280-682
20	ARR FL PLTS, GRTG & LAD 33'-0" TO 60'-0" FLAT ER	6650-230● 6650-231▲
19	PIPING ARR A.E. SYS	2283-702
18	PIPING ARR L.O. FILL & PURIF SYS	6200-463● 6200-750▲
17	PIPING ARR MN STM	6440-507
16	PIPING ARR REL V. ESC E.R.	6451-444● 6451-464▲
15	PIPING ARR BLR SAF V. ESC SYS ER	6451-468
14	STD PIPE HGR & INSTALLATION INSTRUCTION	257056
13	ARR FL PLTS, GRTG & LAD 60'-0" TO 78'-4 FLAT E.R.	6650-236
12	PIPING ARR F.O SERV RECIRC SYS	6950-100
11	PIPING ARR BOILER WTR SAMPLING	6357-85
10	PIPING ARR F.O. SERVICE SUCT SYS	6950-103
9	PIPING ARR 220 PSI CONTAMINATED STM SYS	6450-705● 6480-638▲
8	PIPING ARR BOILER PRESSURE ST	[illegible]● [illegible]▲
7	PIPING ARR REDUCED PRESSURE ST	[illegible]● [illegible]▲
6	PAINTING SCHEDULE	8300-40● 8300-41▲
5	DIRECTIONS FOR INSULATING & LAGGING PIPING	257322
4	PIPING ARR AUX EXH ST SYS	6451-473
3	FABRICATION & WELDING INSTRUCTIONS - CL I & II PIPING	257035
2	" " " " " " " ARR	6555-464
1	DIAGRAM - DRAIN COLLECTING SYS - LIST	6555-465

●HULLS 613C & 614C
▲HULL 615 ONLY

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615C	311	
614C	310	
613C	309	

APPROVALS
OWNERS
ABS NOT REQ'D
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING DEPT.
FSCM NO. 43689

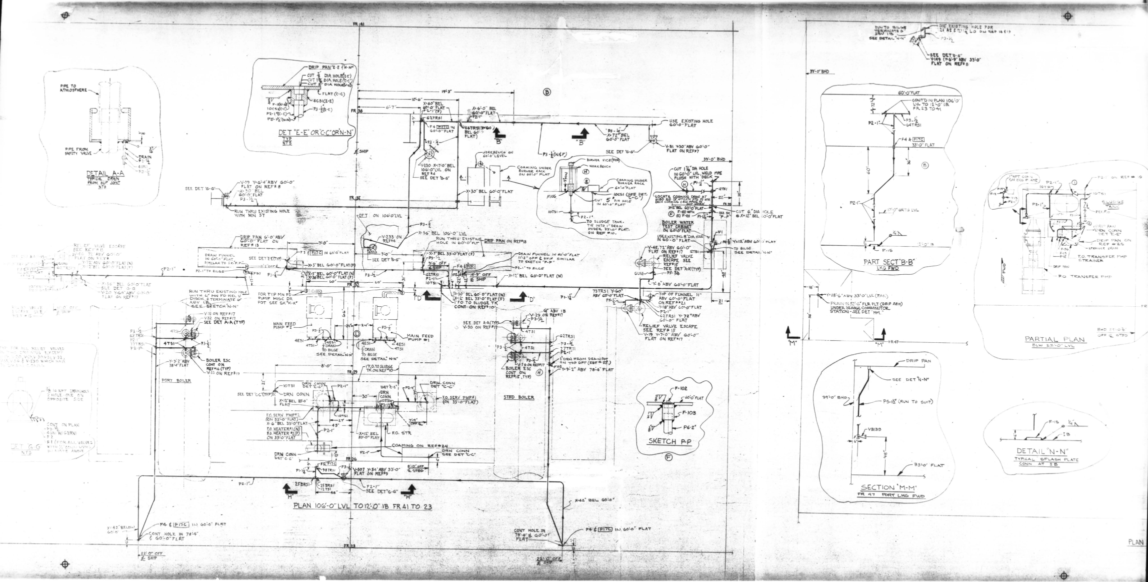
SCALE ½" = 1 FT
DRAWN L. A. McNEIL
CHECKED H. M. EDGE
SECT MGR J. N. Johnson
DATE COMPL. 7-23-76
EXAMINED
AUTHORIZED E. F. Stephenson
DATE 7-26-76
TECH APPROVAL NR
C S D APPROVAL R. F. Wamsley

PIPING ARRANGEMENT
DIRTY DRAIN SYSTEM
PLAN, SECT & ELEV

USMA DESIGN TII-S-116a
USMA DWG NO.
HULL NO.
DWG NO. 6555-472
REV H
SHEET NO. 1 OF 1

6555-472

SEPT. '80
FRAME 1
10X


DETAIL A-A
TYPICAL DRAIN FROM SLIP JOINT
NTS
PIPE TO ATMOSPHERE
PIPE FROM SAFETY VALVE
DET "E-E" OR "C-C" OR "N-N"
TYP
NTS
DRIP PAN "E-E" & "N-N"
FLAT (C-C)
DET G-G
NTS
USE EXISTING HOLE 60'-0" FLAT
SEE DET "G-G"
RUN THRU EXISTING HOLE WITH MN ST
BOILER WATER TEST CABINET ON 60'-0" FLAT
RELIEF VALVE ESCAPE SEE REF #15
MAIN FEED PUMP #2
MAIN FEED PUMP #1
PORT BOILER
STBD BOILER
F.O. SERV PMP #1
F.O. SERV PMP #2
F.O. STR
COAMING ON REF #24
SKETCH P-P
PLAN 106'-0" LVL TO 12'-0" IB FR 41 TO 23
FR 41
FR 38
FR 35
FR 32
FR 29
FR 26
FR 23
PART SECT "B-B"
LKG FWD
PARTIAL PLAN
BLW 33'-0" LVL
SLUDGE TANK
F.O. TRANSFER PMP STRAINER
F.O. TRANSFER PMP
SECTION "M-M"
FR 47 PORT LKG FWD
DETAIL "N-N"
TYPICAL SPLASH PLATE CONN AT IB
PLAN

6555-472

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

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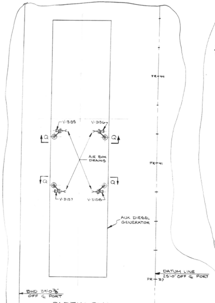
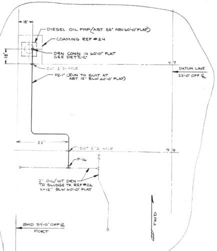
SEPT. '80

FRAME 2

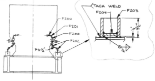
10X


V-3135
V-3136
Q
AIR BOX DRAINS
V-3137
V-3138
FR-44
FR-41
FR-37
AUX DIESEL GENERATOR
DATUM LINE 25'-0" OFF ℄ PORT
BHD 39'-0⅜" OFF ℄ PORT

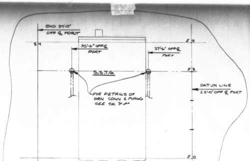
PARTIAL PLAN
60'-0" FLAT


18"
DIESEL OIL PMP (ABT 33" ABV 60'-0" FLAT)
COAMING REF #24
DRN CONN IN 60'-0" FLAT SEE DET "C-C"
CUT 2" ⌀ HOLE
47
DATUM LINE 25'-0" OFF ℄
P2-1" (RUN TO SUIT AT ABT 12" BLW 60'-0" FLAT)
52"
CUT 2" ⌀ HOLE
44
F-16
2" OIL/WT DRN TO SLUDGE TK REF #26 X=12" BLW 60'-0" FLAT
BHD 39'-0" OFF ℄ PORT
FWD

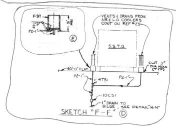
PARTIAL PLAN
78'-4" FLAT TO IB


TACK WELD
F204
F203
F200
F201
F200
F202
P3-½"

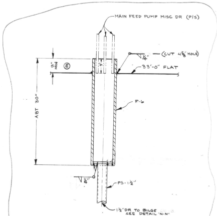
SECT "Q-Q"


BHD 39'-0" OFF ℄ PORT
54
35'-6" OFF ℄ PORT
27'-6" OFF ℄ PORT
53
S.S.T.G.
FOR DETAILS OF DRN CONN & PIPING SEE SK "F-F"
DATUM LINE 25'-0" OFF ℄ PORT
50

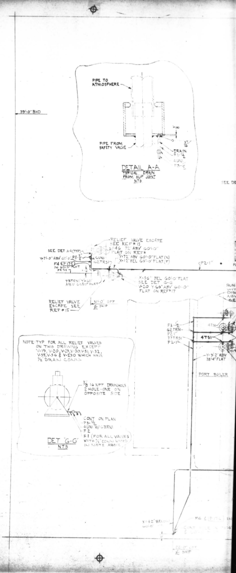
PARTIAL PLAN
60'-0" LVL


F-97
P2-1"
E
VENTS & DRAINS FROM AIR & L.O. COOLERS CONT ON REF #23
S.S.T.G.
CUT 3" DIA HOLE (TYP)
60'-0" FLAT
P2-1"
4TS1
P2-1"
10CS1
1" DRAIN TO BILGE, SEE DETAIL "N-N"

SKETCH "F-F" Ⓓ


MAIN FEED PUMP MISC DR (P/S)
¼"
(CUT 4⅝" HOLE)
33'-0" FLAT
E
ABT 30"
F-6
¼"
P5-1½"
1½" DR TO BILGE SEE DETAIL "N-N"

SKETCH "K-K"
TYP MN FD PUMP MISCELLANEOUS DR POT
NTS


39'-0" BHD
PIPE TO ATMOSPHERE
PIPE FROM SAFETY VALVE
DRAIN
DETAIL A-A
TYPICAL DRAIN FROM SLIP JOINT
NTS
SEE DET A-A (TYP)
RELIEF VALVE ESCAPE SEE REF #15
X-46" ABV 60'-0" FLAT ON REF #
4UNI
62TRS1
F4
Y-72 ABV 60'-0" FLAT (N)
X-12 BEL 60'-0" FLAT (F)
P2-1"
X-36" BEL 60'-0" FLAT SEE DET G-G
RELIEF VALVE ESCAPE SEE REF #15
31'-0" OFF ℄ SHIP
NOTE: TYP FOR ALL RELIEF VALVES ON THIS DRAWING EXCEPT V-19, V-20, V-29, V-30, V-31, V-32, V-35, V-36 & V-230 WHICH HAVE ½ DRAIN CONN.
⅜ 16 NPT DRAIN HOLE 2 HOLE-ONE ON OPPOSITE SIDE
CONT ON PLAN
P3-½
4UNI W/-BRN
F2
F1 (FOR ALL VALVES WITH ½" CONN LISTED IN NOTE ABOVE)
DET "G-G"
NTS
4TS1
PORT BOILER
Y-9'-2" ABV 78'-4" FLAT
SEE DE

6555-472

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME 3
10X

6555-473

CSD VAULT

E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 4-25-79
SIGNED

YARD PRINTS

ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS									
	REV.	G	G	F	D	G	G	G	G
	SHEET	1	2	3	4	5	6	7	8

GROUP
MC NO.

G15C 311
G14C 310
G13C 309
NNS&DDCO HULL No. | MARAD HULL No. | USMA DESIGN | SHIP'S NAME

DWG. REV. — HULL APPLIC. (NN HULLS ONLY)

REV.	G13C	G14C	G15C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES
D	YES	YES	YES
E	YES	YES	NO
F	YES	YES	NO
G	NO	YES	NO

APPROVALS
OWNERS NOT REQD
ABS NOT REQD
USCG NOT REQD

Newport News Shipbuilding
A Tenneco Company
TENNECO
Commercial Ship Division
FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING
INSTALLATION GROUP 6555-0115-1001 SI
6555-0115-1002 SI

FOR ARR. SEE DWG 6555-472

SCALE NONE =1 Ft.
DRAWN L.A. MCNEIL
CHECKED H.M. EDGE
SECT. MGR. J.B. Johnson
DATE COMPL. 7-23-76
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 7-26-76
TECH. APPROVAL NR
CSD APPROVAL R. L. Hawright

GROUPED BY CHK. | DATES COMP. PART | GROUP NO. KEY | HULL G13C

TYPE OF DWG.

TITLE
DIRTY DRAINS
ENGINE ROOM
LIST OF MAT'L

DWG. NO. 6555-473 REV G SHEET NO. 1 OF 8

1018

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D	OWNER DATE	OWNER APPD.
A	—	INITIAL ISSUE	7/23/76	JBJ	—	—
B	6 4 3 7	DELETED LINE 6; ALT'D QTY LINE 2 WAS 16. QTY LINE 13 WAS 2. QTY LINE 2 WAS 135'-0" LINE 1 THRU 4 CHG MATL SOURCE TO STOCK			—	—
	4	LINES 11&12 CHG'D S/M FROM MO 216691				
	7	ADDED LINES 7-17	10/3/77	JBJ		
C	5	INCREASED QTY LINE 2&3.			—	—
	6	INCREASED QTY LINE 2&3. ADDED LINE 13, 14, &18.				
	5	LINE 2 WAS 350'-0" LINE 3 WAS 380'-0" ADDED LINES 9,10,11,12,13,14,15,16,17				
	3	ADDED LINES 6&7&8 QTY LINE 2 WAS 185'-0"	12/21/77	JBJ		
D	4 6 7	LINE 10 M/S WAS PO 608C-6450-C21 ⑥ INCREASED QTY LINE 10. (WAS 1) ADDED LINE 18.	7/5/78	JBJ	—	—
E	8	ADDED LINES 1-5 (WORK ACCOMP ON G13C)	9/7/78	JBJ	—	—
F	3	ALT'D QTY LINE 3, WAS 140'-0" ADDED LINES 10 THRU 18 GER	10/24/78	JBJ	—	—
G	8 5 7	ADDED LINE 6 DELETED LS 7&8, ADDED L.5 ADDED L.5 & L.13.				
	6	INCREASED QTY LINE 10, WAS 2. WORK ACCOMPLISHED ON H613C	4/23/79			

NOTES

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION, SEE REF#1.

NO.	REFERENCES	DWG. NO.
1	DIAGRAM-DRAIN COLLECTING SYS-LIST	6555-465

HULL NO. G13C, G14C, G15C DWG. NO. 6555-473
REV. G SHEET 1 OF —

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	30'	P1-1¼	1¼" IPS X STD THK C-STL	K-57-06-115	PS	
C		2	200'0"	P2-1"	1" IPS X STD THK CARBON STL	K57-04-105		
F		3	150'0"	P3-½"	½" IPS X"X" HVY THK CARBON STL	K57-07-102		
		4	60'	P4-⅜	⅜" IPS X"X" HVY THK CARBON STL	K57-07-101		
		5						
C		6	1	F-16	2"X2"X1" TEE SW STL 3000#	S 25-60-300	ST-PS	
C		7	1	10CS1	1" COUPLING STL SW 3000#	S 25-60-054		
C		8	5	HS	1" FIXED HGR	S 25-44-342		
		9						
F		10	8	F200	½" IPS X STD THK NIPPLE STL	S/ 25-14-086E	ST-PS	
F		11	4	F201	½" 90° ELL MI GALV	S/ 25-09-506		
F		12	8	F202	½" 45° ELL MI GALV	S/ 25-10-194		
F		13	4	F203	6" IPS X STD THK PIPE STL L=3½"	S/ 57-06-114		
F		14	4	F204	½" THK STL PLATE 6" DIA	S/ 72-40-265		
F		15	1	V-3135	½" GLOBE STOP VLV BRONZE SCRD 200#	S/ 26-09-106		
F		16	1	V-3136				
F		17	1	V-3137				
F		18	1	V-3138				

REMARKS -

SERVICE - DIRTY DRN SYS ER

MC 110 PS=178

GROUP NO. 6555-0115-1002 SI SHT 1 OF 2

APPLICABLE HULLS G13C G14C G15C

DWG NO. 6555-473 SHEET 3 REV. F

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	22	4UN1	½" UNION SCR'D 300# M.I.	PO ⑨ 2600-C40	MD-PS	
		2	4	6BRN1	½"X⅜" BUSHING 150# M.I. SCR'D	⑧		
		3	9	4CS1	½" COUPLING, SW, 3000# STL	PO 608C- ⑧ 2300-P3		
		4	6	4TS1	½" TEE, SW, 3000# STL	PO 608C- 6450-P21 ①		
		5	4	62TRS1	1x½x½ RED TEE SW 3000# STL	S/ 25-60-242	ST-PS	
		6	2	77TRS1	1"X1"X½	PO 608C- 2300-P3 ③	MD-PS	
		7	10	F1	½ IPS NIPPLE STL X-HVY THREADED 3" LG	S/ 25-14-847E	ST-PS	
		8	4	F2	⅜ IPS	S/ 25-14-842E		
		9	1	F3	½ DECK SLEEVE STL WELDED	S/ 25-20-174		
D		10	7	10CS1	1" COUPLING STL SW 3000#	STK 97-14-304	MD-PS	
B		11	20	H5	½" FIXED HANGER SINGLE LEG WITHOUT LINER	S/ 25-44-322	ST-PS	
B		12	20	H5	1"	S/ 25-44-342		
B		13	1	F5	1¼" DK SLEEVE STL WELDED	S/ 25-20-180		
		14	1	95TRS1	1¼"X1¼X⅜" RED TEE STL SW 3000#	S 25-60-252		
		15	2	73TRS1	1"X¾"X1"	PO ② 2600-C36	MD-PS	
		16	4	F4	1" DK SLEEVE STL WELDED	S/ 25-20-178	ST-PS	
C		17	3	6UN1	¾" UNION SCR'D 300# MI	PO ⑩ 2600-C40	MD-PS	
		18						

REMARKS -

SERVICE - DIRTY DRN SYS E.R.

MC 110 PS=178

GROUP NO. 6555-0115-1002 SI SHT 2 OF 2

APPLICABLE HULLS G13C G14C G15C

DWG NO. 6555-473 SHEET 4 REV. D

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	170'0"	P1-1¼"	1¼" IPS X STD THK CARBON STL	K57-06-105	PS	
C		2	370'0"	P2-1"	1" IPS X STD THK CARBON STL	K57-04-105		
C		3	390'0"	P3-½"	½" IPS X STD THK CARBON STL	K57-06-104		
		4	25'0"	P5-¾"	¾" IPS X"X" HVY THK CARBON STL	K57-07-103		
G		5	1	F104	BURNER TIP VISE	FURN WITH BOILER	—	
C		6	1	F96	2"X1" BUSHING SCRD.	S/ 25-05-254	ST-PS	
G		~~7~~	~~1~~	~~F98~~	~~DRAIN POT~~	~~MO 216707 SH 9 L 11~~		
G		~~8~~	~~1~~	~~F99~~	~~DRAIN POT COVER~~	~~MO 216707 SH. 9 L 7~~		
C		9	26	F-15	6"X6"X⅜" THK STL SPLASH PLATE	MO 216707 SH. 9 L 18		
C		10	6	10TS1	1" TEE STL SW 3000#	PO 608C 6450-C21 ②		
C		11	3	10CS1	1" COUPLING STL SW 3000#	S/ 25-60-054		
C		12	4	F12	1" 90° ELL STL SW 3000#	S/ 25-60-029		
C		13	2	F13	1" UNION SCRD 300# MI	S/ 25-12-168		
C		14	1	F-14	1" NPT NIPPLE STL 2" LG	S/ 25-14-874E		
C		15	1	77TRS1	1"X1"X½" TEE SW 3000# STL	S/ 25-60-235		
C		16	4	4CS1	½" COUPLING STL SW 3000#	S/ 25-60-052		
C		17	1	①	1" SWING CHK 125# SCRD BRONZE	S/ 26-07-168		
C		18	1	②	1" G.S.V. STL. S.W.	S/ 26-09-277		

REMARKS -

SERVICE - DIRTY DRN SYS ER

MC 110 PS=173

GROUP NO. 6555-0115-1001 SI SHT 1 OF 3

APPLICABLE HULLS G13C G14C G15C

DWG NO. 6555-473 SHEET 5 REV. G

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	5	12CS1	1¼" COUPLING, S.W., 3000# STL	S/ 25-60-055	ST-PS	
C		2	25	10CS1	1"	S/ 25-60-054		
C		3	17	4CS1	½"	PO 10PCS. ⑯ 6200-M12 PO 8PCS ⑧ 608C-2300-P3	MD-PS	
		4	6	6BRN1	½"X⅜" BUSHING 150# MI SCR'D	PO ⑧ 2600-C40		
		5	6	4UN1	½" UNION SCR'D 300# MI	⑨		
B		~~6~~	~~1~~	~~77TRS1~~	~~1"X1"X½" RED TEE, SW, 3000# STL~~	~~㉗ 6200-M12~~		
		7	1	64TRS1	1"X½"X1" RED TEE, SW, 3000# STL	① 2600-C36		
		8	5	62TRS1	1"X½"X½"	S/ 25-60-242	ST-PS	
C		9	6	10TS1	1" TEE SW, 3000# STL	PO 608C- ② 6450-P21	MD-PS	
G		10	3	12TS1	1¼"	S/ 25-60-090	ST-PS	
		11	2	25BRS1	1¼"X1" INSERT RED STL SW 3000#	S/ 25-60-373		
		12	1	98TRS1	1¼"X1¼"X½" RED. TEE STL SW 3000#	S/ 25-60-251		
C		13	2	4TS1	½" TEE S.W. 3000# STL	PO 608C ① 6450-P21	ST-PS	
C		14	4	4ES1	½" 90° ELBOW S.W. 3000# STL	S 25-60-006		
		15	6	F2	⅜" IPS NIPPLE STL X-HVY THREADED 3" LG	S 25-14-842E	ST-PS	
		16	6	F4	1" DK SLEEVE STL WELDED	S/ 25-20-178		
		17	1	F5	1¼ DK SLEEVE STL WELDED	S/ 25-20-180		
C		18	6	F97	DRAIN POT 9" LONG ASSY 95 ON 216707	MO 216707 SH. 10 L 5	ST-PS	

REMARKS -

SERVICE - DIRTY DRN SYS E.R

MC 110 PS=173

GROUP NO. 6555-0115-1001.SI SHT 2 OF 3

APPLICABLE HULLS G13C G14C G15C

DWG NO. 6555-473 SHEET 6 REV. G

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
B		1	25	H-5	1¼" HANGER SINGLE LEG WITHOUT LINER	S/ 25-44-352	ST-PS	
B		2	40	H-5	1"	S/ 25-44-342		
B		3	40	H-5	½"	S/ 25-44-322		
B		4	2	H-5	¾"	S/ 25-44-332		
G		5	1	F106	6" IPS X STD THK PIPE L=9"	S/ 57-06-114	ST-PS	
		6						
E		7	7	10CS1	1" COUPLING STL SW 3000#	S 25-60-054	ST-PS	
B		8	7	F-11	1-½" COUPLING STL SW 3,000#	S 25-60-056		
B		9	60'0"	PS	1-½" IPS X STD THK PIPE (STL)	S. 57-06-106	PS	
C		10	2	F-6	DRAIN POT 30" LONG ASSY 96 DWG.-216707	MO 216707 SH. 10 L.1	ST-PS	
B		11	12	H-2	1½" FIXED HGR	S 25-41-362	ST-PS	
G		12	200'0"	P2	1" IPS X STD THK PIPE STL	K57-04-105	PS	
G		13	1	F105	1" TEE SW STL 3000#	S/ 25-60-079	ST-PS	
B		14	3	F-8	¼"-20NC-2 NUT, STL HEAVY HEX	S 21-31-108	ST-PS	
B		15	3	F-9	¼"-20NC-2 SCREW, BRASS ROUND HD, SLOTTED, ⅜ LG	S 23-11-254		
B		16	1	F-10	STRAINER PLATE-5-½" OD.X ⅛" THK, CU-NI ITEM F-1 ON 216707	MO 216707 SH6 L14		
B		17	10	H-2	1" FIXED HGR	S 25-41-342		
D		18	1	V-1	1¼" SWING CHECK VALVE SCR'D BRONZE 125#	S/ 26-07-170	ST-PS	

REMARKS -

SERVICE - DIRTY DRN SYS ER

MC 110 PS=173

GROUP NO. 6555-0115-1001 SI SHT 3 OF 3

APPLICABLE HULLS G13C G14C G15C

DWG NO. 6555-473 SHEET 7 REV. G

INSTALLATION GROUP

REV.	LINE	ITEM NO.	QTY (1 SHIP)	ITEM NO.	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
E		1	1	F-100	2" TEE STEEL S.W. 3000#	S/ 25-60-082	ST-PS	
E		2	2	F-101	2"X1¼" INSERT REDUCER S.W. 3000#	S/ 25-60-383		
E		3	1	F-102	2" PLUG SCR'D STEEL	S/ 25-17-296		
E		4	1	F-103	2" COUPLING SCR'D STEEL	S/ 25-07-114		
E		5	12"	P-6	2" IPS X STD THK STEEL PIPE	S/ 57-06-107	PS	
G		6	1	V3139	1½" GLOBE STOP VALVE SCR'D BRONZE 200#	S/ 26-09-114	ST-PS	
		7						
		8						
		9						
		10						
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						

REMARKS -

SERVICE - DIRTY DRAIN SYS E.R

PS-173 (614C)

GROUP NO. 6555-0115-1001 SI

APPLICABLE HULLS 613C 614C

DWG NO. 6555-473 SHEET 8 REV. G

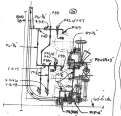
6555-473

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA • ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.

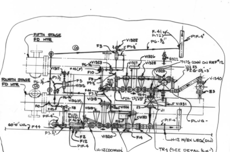
SEPT. '80

FRAME

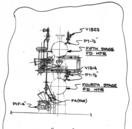
8X


BHD 38
P6-3/4"
V-3147
F38
G
F42 W/ F47
F39
P7-1/2"
F43
P6-3/4"
F42 W/ F40
F38
F39
V-3145
P7-1/2"
P2-1/2"
V-3146
V-3148
P2H-2½×3"
60'-0" LVL
F4(FAR)
P1F-4"

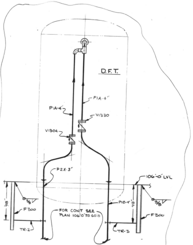
ELEV "C-C"
LKG OUTBD


FIFTH STAGE FD HTR
FOURTH STAGE FD HTR
G
F3
V1325
P7-1/2"
F-41 W/ P-72
P6-3/4"
P1F-4"
V1326
V1322
P6-3/4" V1323
V1327
V1328
T-175 CONN ON REF #12
1/2 Z3
P2G-2½×3"
V1317
F45(F)
F10
V1329
V-1340
P6-3/4"
P7-1/2"
F5
V1315
F9
P7-1/2"
Z3
F44
P7-1/2"
TR-1
P2H-2½×3"
P6-3/4"
V1316(H)
V1318
V1331
F0
F45
F8
V1319
V1324
Z3
J1
P1F-4"
PLUG BOSS (F46)
F13
V1321
P1F-4"
PLUG
60'-0" LVL
F44
P7-1/2"
V1320
F2
F12
F14
P1F-4
H-12 W/EX LEG (DN)
H-12 (DOWN & INVERTED)
TR-1 (SEE DETAIL "S-S")

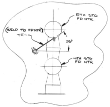
SECT "A-A"
LKG FWD


V1322
P7-1/2"
FIFTH STAGE FD HTR
V1314
P7-1/2"
FOURTH STAGE FD HTR
P1F-4"
F4(FAR)

ELEV "B-B"
LKG INBD


D.F.T.
P1A-4"
P1A-4"
V1330
V1304
P2X-3"
106'-0" LVL
48"
48"
F300
F300
FOR CONT SEE PLAN 106'0" TO 60'0
P1B-4"
TR-2
TR-3

ELEV "D-D"
LKG TO ℄


5TH STG FD HTR
(WELD TO FD HTR)
TR-1
36"
4TH STG FD HTR

DETAIL "S-S"

REV	ZONE	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
A	ALL	INITIAL ISSUE	11/12/6		—	—
B	—	ALT'D RUN P2L-3" DELETED MN ENG GLAND SEAL REGULATOR AND ASSOCIATED DRAIN PIPING & STATION.	1/14/7		—	—
C	—	ADDED VLV NOS V1378, V1379, V1380, & V1465. ADDED VLV NO V3085. REVERSED V1377 & V1464.	4/15/7		—	—
D		ADDED: CONN FOR G-90 ON P2L-3", REFERENCE 13, & HOLE CUT CALLOUT-FR 47 STBD.	6/21/8			
E	-	INDICATED F-7 & F-17 TO BE CR-MOLY STL WHERE APPLICABLE.	7/7/8			
F	—	ADDED FLANGE & BOLTING FOR V1329 LAM				
	—	ADDED RED PRESS STM DRN IN PLAN VIEW BLW 33'-0" LVL FWD. ADDED PART PLAN BLW 33'-0" LVL & ELEV "R-R" GER				
		MODIFIED HANGERS THRUOUT PLAN GER	10/11/8			
G		SECT "A-A" & ELEV "C-C"; ADDED VENTS FROM 4TH & 5TH STG FD HTR. PLAN 33'-0" LVL & BEL; ADDED VENTS FROM CONTAM ST. GEN HEAD. SECT "T-T" ADDED TO SUIT. (WORK ACCOMP ON 613C BY LIAISON NO: 613C-JHJ-88)				
		SECT "A-A" & ELEV "C-C"; ALT'D LOW LEVEL SENSING PIPING FROM 4TH & 5TH STG FD HTR. (WORK ACCOMP ON 613C BY LIAISON NO: 613C-JHJ-51)	2/21/9			

AUTHORITY:

GENERAL NOTES:

1. THIS PLAN DEVELOPED IN ACCORDANCE WITH REFERENCES 1 & 2.
2. ALL MATERIAL IS TO MEET THE REQUIREMENTS OF THE UNITED STATES COAST GUARD & AMERICAN BUREAU OF SHIPPING. SEE REF #1 FOR LIST OF ACCEPTABLE MATERIALS.
3. ALL WELDING IS TO BE ACCOMPLISHED BY CERTIFIED WELDERS & SHALL MEET THE REQUIREMENTS OF THE U.S.C.G, ABS & REF #3.
4. COUPLINGS & BACKING RINGS SHOWN IN LIST OF MATERIAL ARE TO BE USED AS REQUIRED.
5. CARE IS TO BE TAKEN THAT PIPES, BRACKETS & HANGERS DO NOT INFRINGE ON THE SPACE REQUIRED FOR OVERHAUL OF HEAT EXCHANGERS PUMPS & ETC.
6. NON DETAILED PIPE IS TO BE RUN TO BEST ADVANTAGE ON SHIP APPROXIMATELY AS SHOWN.
7. PAINTING IS TO BE IN ACCORDANCE WITH REF #6.
8. TESTS ARE TO BE IN ACCORDANCE WITH REF # 1.
9. "X" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE BENEATH IT. "Y" IS THE DISTANCE FROM A GIVEN LEVEL TO THE CENTER OF A PIPE ABOVE IT.
10. ALL PIPING ON THIS ARR IS CLASS I EXCEPT PIPING DOWNSTREAM OF LAST CUT OUT VALVE FROM DRAIN POINT WHICH IS CLASS II.
11. ALL WELDS ACCOMPLISHED ABOARD SHIP SHALL BE AS FOLLOWS: BUTT WELD P-3, SOCKET WELD P-14 & FLANGE WELD P14A & P-16A ON REF # 3 EXCEPT AS OTHERWISE NOTED.
12. LOCATION DIMENSIONS ARE FOR REFERENCE ONLY & MAY BE SLIGHTLY ALTERED TO SUIT INSTALLATION.
13. ALL HOLE CUTS ARE APPROVED ON STRUCTURAL DWG.
14. PIPE HANGERS AND TIE RODS INDICATED (H) ON PLAN ARE TO BE INSTALLED WITHIN 6" OF POSITION SHOWN. NO ADDITIONAL HANGERS MAY BE ADDED BETWEEN DRAIN POTS AND TRAPS. ADDITIONAL HANGERS MUST BE INSTALLED TO SUPPORT PIPING DOWNSTREAM OF TRAPS IN ACCORDANCE WITH REF #4.
15. JOINTS REF. TO THIS NOTE REQUIRE SPECIAL WELDING. VALVES 1¼ CR-MO TO CARBON STL PIPE.
16. HANGERS SHOWN IN B/M ARE TO BE INSTALLED IN ACCORDANCE WITH REF #4 & NOTE 14.

FOR LIST OF MATERIAL, NOTES & REF. SEE NN DWG Nº 6555-476

DWG. REV. — HULL APPLIC						
REV	NN HULLS ONLY					
A	YES	YES				
B	YES	YES				
C	YES	YES				
D	YES	YES				
E	YES	YES				
F	YES	YES				
G	YES	YES				

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 2-21-9 SIGNED

NO.	REFERENCES	DWG NO.
Ⓓ 13	LIST OF PRESSURE & VAC GAGES FURN BY SHIPYARD	6750-483
12	LIST OF THERMOMETERS FURNISHED BY SHIPYARD	6750-482
11	PP ARR LP STEAM DRN SYS - PLAN	6555-466
10	PP ARR RED. PRESS. STEAM SYS - PLAN	6450-740
9	PP ARR BOILER SAT. STM & SUPER HTR CONTRL	6440-517
8	PP ARR BOILER PRESS. STEAM SYS - PLAN	6450-737
7	PP ARR MN STEAM SYS - PLAN	6440-507
6	PAINTING SCHEDULE	8300-40 ⊛ 41 △
5	DIRECTIONS FOR INSULATING & LAGGING PIPE & AUX	257322
4	STANDARD PIPE HANGERS	257056
3	FABRICATION & WELDING INSTRUCTIONS-CL I & II	257035
2	DIAGRAM DRAIN COLLECTING SYS - PLAN	6555-464
1	DIAGRAM DRAIN COLLECTING SYS - LIST	6555-465

⊛ HULLS 613C & 614C
△ HULL 615

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C 613C	310 309	

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
Commercial Ship Division
COMMERCIAL SHIP ENGINEERING
FSCM NO. 43689

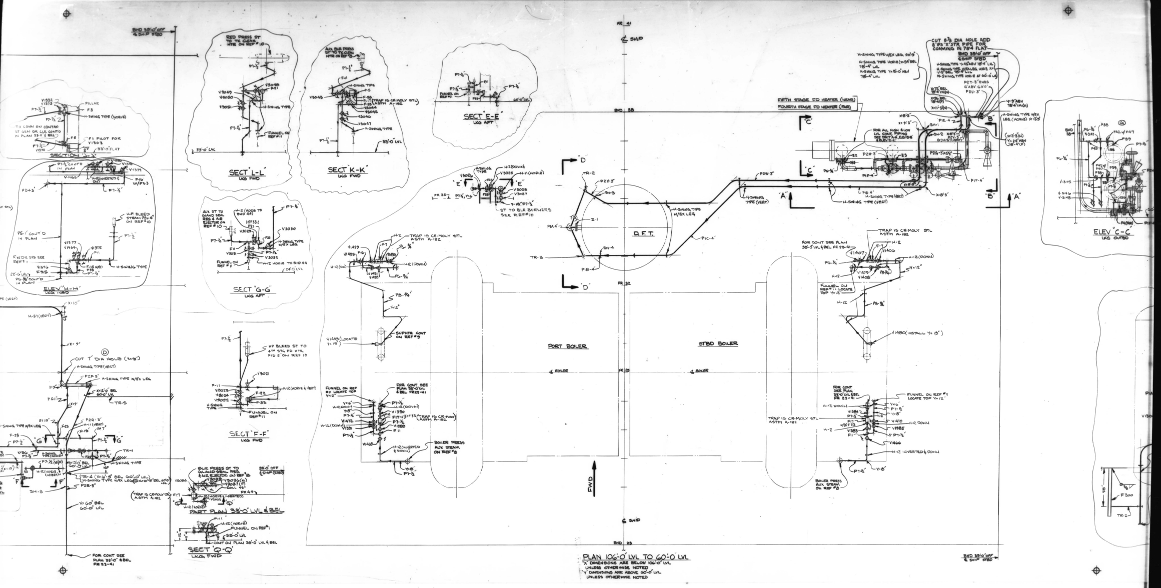
SCALE ½" = 1 FT
DRAWN D. L. HOFFMAN
CHECKED H. M. EDGE
SECT MGR J. H. Johnson
TECH APPROVAL NR
DATE COMPL 11-12-6
EXAMINED
AUTHORIZED E. E. Stephenson
DATE 11-12-76
CSD APPROVAL EEB for R. L. HARRINGTON

PIPING ARR H.P. STEAM DRAIN SYS ENG ROOM — PLAN, SECT & ELEV.

USMA DESIGN T11-S-116a
USMA DWG NO.
HULL NO.
DWG NO. 6555-475
REV G
SHEET NO. 1 OF 1

6555-475

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
SEPT. '80
FRAME 1
10X

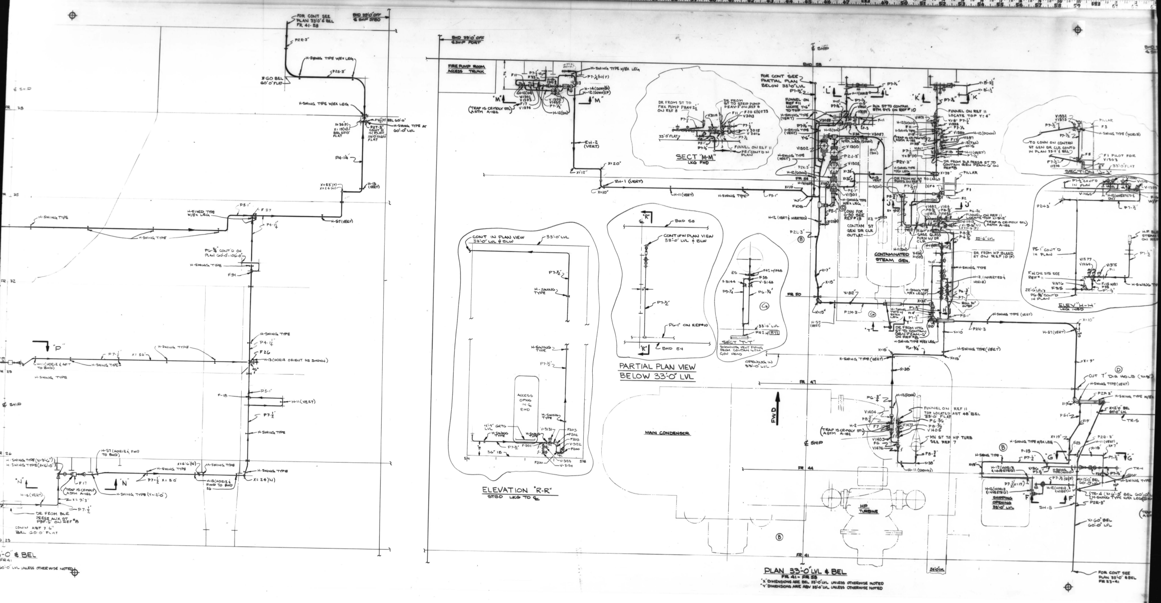

BHD 33'-0" OFF & SHIP STBD
SECTION "J-J"
V1332
V1373
PILLAR
F3
H-SWING TYPE (HORIZ)
TO CONN ON CONTAN ST GEN OR CLR CONTD IN PLAN 33'-0" & BEL
F1 PILOT FOR V1303
33'-0" FLAT
ELEV "H-H" LKG INBD
P2-3"
H.P. BLEED STEAM P2U-4" ON REF #10
F.N.D.R SYS SEE REF #11
H-SWING TYPE
RED PRESS ST TO TK CLEAN HTR ON REF #10
V3049
V3050
V3051
H-SWING TYPE
33'-0" LVL
SECT "L-L" LKG FWD
AUX BLR PRESS ST TO TK CLEAN HTR ON REF #10
V3043
H-SWING TYPE
F-11 (TRAP IS CR-MOLY STL) ASTM A-182
V3044
V3045
V3046
V3047
FUNNEL ON REF #11
33'-0" LVL
SECT "K-K" LKG FWD
SECT "E-E" LKG AFT
FUNNEL ON REF #11
60'-0" LVL
AUX ST TO GLAND SEAL REG & AIR EJECTOR ON REF #10
H-12 (HORIZ TO BHD 44)
V3029
V3030
H-SWING TYPE W/EX LEG
V3031
V3032
FUNNEL ON REF #11
H-12 HORIZ TO BHD 44
24'-0" LVL
SECT "G-G" LKG AFT
HP BLEED ST TO 4TH STG FD HTR P1D 5" ON REF 10
V3021
V3023
V3024
V3022
H-SWING TYPE
H-12 (HORIZ & VERT)
F-22
F-33
FUNNEL ON REF #11
SECT "F-F" LKG FWD
BLR PRESS ST TO GLAND SEAL REG & AIR EJECTOR ON REF #8
33'-0" OFF & SHIP (STBD)
V3034
V3035
V3036 (N)
V3037 (F)
(TRAP IS CR-MOLY STL ASTM A-182)
FR 44
PART PLAN 33'-0" LVL & BEL
H-12 (HORIZ)
FUNNEL ON REF #11
33'-0" LVL
CONT ON PLAN 33'-0" LVL & BEL
SECT "Q-Q" LKG FWD
X=10"
H-57 (VERT)
X=9"
CUT 7" DIA HOLE (X=19")
H-SWING TYPE (VERT)
P2R-3"
H-SWING TYPE W/EX LEG
X=12'-0" BEL 60'-0" LVL
TR-5
P2Q-3"
H-11 (VERT)
H-SWING TYPE W/EX LEG
TR-4
H-SWING TYPE
TR-4 (X=6'-3" BEL 60'-0" LVL) H-SWING TYPE W/EX LEG
P2R-3"
SH-5
X=60" BEL 60'-0" LVL
FOR CONT SEE PLAN 33'-0" & BEL FR 23-41
FR 41
℄ SHIP
BHD 38
"D"
TR-2
P2X-3"
SH-3
H-SWING TYPE W/EX LEG
Z-1
P1A 4"
D.F.T.
P1C-4"
SH-4
TR-3
P1B-4
FR 32
"E"
V3026
H-SWING TYPE
H-2 (DOWN)
V3025
H-11 (HORIZ)
V3028
V3027
Y=18", P7-1/2"
ST TO BLR BURNERS SEE REF #10
FR 35
P2W-3"
H-SWING TYPE (VERT)
"A"
H-SWING TYPE (VERT)
P1D 4"
H-SWING TYPE (VERT)
FIFTH STAGE FD HEATER (NEAR)
FOURTH STAGE FD HEATER (FAR)
"C"
FOR ALL HIGH & LOW LVL CONT. PIPING SEE SECT A-A, ELEV B-B & ELEV C-C
P2H-3"
P2G-3"
P1F-4"
P1E-4
"B"
CUT 8 7/8 DIA HOLE ADD 8" IPS "X" STR PIPE FOR COAMING IN 78'-4 FLAT
BHD 33'-0" OFF & SHIP STBD
H-SWING TYPE W/EX LEG
H-SWING TYPE (HORIZ) W/EX LEG
P2T-3" ENDS 12" ABV 60'-0"
P2U-3"
ELEV "C-C" LKG OUTBD
V1429
V1433
H-2
TRAP IS CR-MOLY STL ASTM A-182
H-12 (DOWN)
P8-3/4"
SUPHTR CONT ON REF #9
V1435 (LOCATE Y=19")
FUNNEL ON REF #11 LOCATE TOP Y=12"
FOR CONT SEE PLAN 33'-0" LVL & BEL FR 23-41
V1390
V1472
V1389
V1391
F17 W/(3) F33 (TRAP IS CR-MOLY) ASTM A-182
F11
V1468
H-12 (INVERTED & DOWN)
BOILER PRESS AUX STEAM ON REF #8
PORT BOILER
℄ BOILER
FR 29
STBD BOILER
℄ BOILER
TRAP IS CR-MOLY STL ASTM A-182
FWD
FOR CONT SEE PLAN 33'-0" LVL & BEL FR 23-41
V1407
V1406
H-12 (DOWN)
FUNNEL ON REF #11 LOCATE TOP Y=12"
V1480 (INSTALL Y=19")
FOR CONT SEE PLAN 33'-0" LVL & BEL FR 23-41
FUNNEL ON REF #11 LOCATE TOP Y=12"
V1384
V1470
V1385
V1466
H-12 INVERTED & DOWN
BOILER PRESS AUX STEAM ON REF #8
℄ SHIP
BHD 23
BHD 33'-0" OFF & SHIP STBD
TR-2
F300

PLAN 106'-0" LVL TO 60'-0" LVL
"X" DIMENSIONS ARE BELOW 106'-0" LVL UNLESS OTHERWISE NOTED
"Y" DIMENSIONS ARE ABOVE 60'-0" LVL UNLESS OTHERWISE NOTED

6555-475

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
KEUFFEL & ESSER CO.

SEPT. '80
FRAME 2
10X


FOR CONT SEE PLAN 33'-0" & BEL FR 41-58
BHD 33'-0" OFF ℄ SHIP STBD
BHD 33'-0" OFF ℄ SHIP PORT
FIRE PUMP ROOM ACCESS TRUNK
℄ SHIP
BHD 58
SECT "M-M" LKG FWD
CONTAMINATED STEAM GEN.
SECTION "L-L"
ELEV "H-H" LKG INBD
PARTIAL PLAN VIEW BELOW 33'-0" LVL
SECT "T-T"
ELEVATION "R-R" STBD LKG TO ℄
FR 58
FR 54
FR 50
FR 47
FR 44
FR 41
FWD
MAIN CONDENSER
HP TURBINE
SHIPPING OPENING 33'-0" LVL
H-SWING TYPE
H-SWING TYPE W/EX LEG
PLAN 33'-0" LVL & BEL
FR 41 - FR 58
"X" DIMENSIONS ARE BEL 33'-0" LVL UNLESS OTHERWISE NOTED
"Y" DIMENSIONS ARE ABV 33'-0" LVL UNLESS OTHERWISE NOTED
FOR CONT SEE PLAN 33'-0" & BEL FR 23-41
-0" & BEL
60'-0" LVL UNLESS OTHERWISE NOTED

6555-475

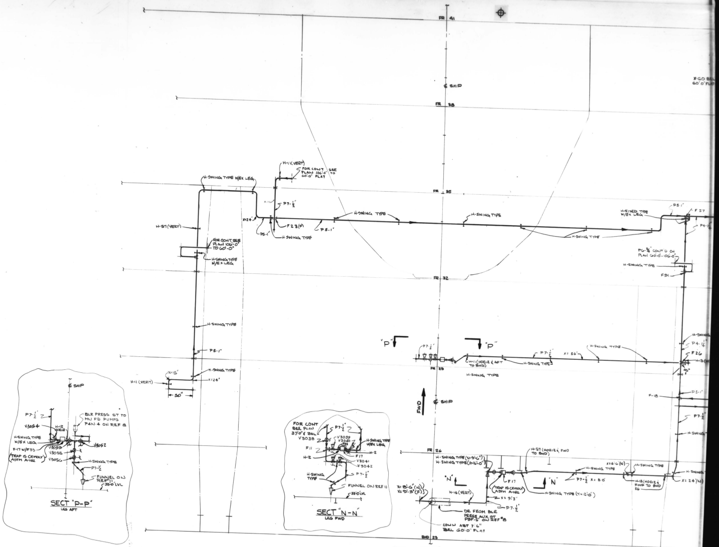
MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

FRAME 3

10X


FR 41
℄ SHIP
FR 38
* 60 BEL
60'0" FLA
H-11 (VERT)
FOR CONT SEE PLAN 106'-0" TO 60'-0" FLAT
H-SWING TYPE W/EX LEG
FR 35
P7-½"
X=24"
F23(P)
P5-1"
H-SWING TYPE
H-57 (VERT)
FOR CONT SEE PLAN 106'-0" TO 60'-0"
H-SWING TYPE W/EX LEG
H-FIXED TYPE W/EX LEG
P5-1"
F 27
P4-1¼"
P6-¾" CONT'D ON PLAN 60'-0"-106'-0"
F31
FR 32
P5-1"
X=15"
X=24"
H-11 (VERT)
30"
"P"
P7-½"
H-11 (HORIZ & AFT TO BHD)
FR 29
X=56"
P4-1¼"
F26
H-13
45°
FWD
℄ SHIP
F-18
P5-1"
FR 26
H-SWING TYPE (X=9'-6")
H-SWING TYPE (X=16'-0")
H-57 (HORIZ & FWD TO BHD)
"N"
F17
TRAP IS CR-MOLY ASTM A-182
X=8'-6"(N)
X=9'-3"(F)
H-13 (VERT)
X=9'-3"
P7-½"
H-SWING TYPE (Y=12'-0")
P7-½" X=8'-0"
X=6'-6"(N)
H-13 (HORIZ & FWD TO BHD 26
X=24"(N)
DR FROM BLR PRESS AUX ST PBF-5 ON REF #8
CONN ABT 7'-6" BEL 60'-0" FLAT
BHD 23
BLR PRESS ST TO MN FD PUMPS P4N-4 ON REF 8
V3054
H-12 HORIZ
V3052
F-17 W/F33
V3053
V3055
V3056
FUNNEL ON REF 11
33'-0" LVL
SECT "P-P"
LKG AFT
FOR CONT SEE PLAN 33'-0" & BEL
V3038
V3039
V3040
F33
F11
H-2
V3041
V3042
SECT "N-N"
LKG FWD

PLAN 33'-0" & BEL

FR 23 - FR 41

"X" DIMENSIONS ARE BEL 60'-0" LVL UNLESS OTHERWISE NOTED

6555-475

MICRO-MASTER 105 mm
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SEPT. '80

FRAME 4

10X

6555-476

CSD VAULT
E
6555-476

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS
GROUPING YES
DATE 2-21-9
SIGNED

YARD PRINTS | ORDERED BY DESIGN

REVISIONS — REFER TO SHEET NO. 2

REV. STATUS OF SHEETS																											
	REV.	F	F	B	B	A	E	A	A	A	D	A	F	D	A	F	F	A	A	A	E	E	C	E	A	E	E
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
REV.	E	E	F	F																							
SHEET	27	28	16A	16B																							

GROUP
MC NO.

PARTIAL ISSUE
SHEETS 1, 2, 12, 15, 16, 16A, 16B ONLY

NNS&DDCo HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
614C 613C	310 309	T11-S-116a	

DWG. REV. — HULL APPLIC.

REV.	613C	614C
A	YES	YES
B	YES	YES
C	YES	YES
D	YES	YES
E	YES	YES
F	YES	YES

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company
TENNECO

Commercial Ship Division
FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING

ARRANGEMENT DWG 6555-475
PIPE DETAIL DWG 6555-477
INSTALLATION GROUP: 6555-0106-1001 SI, 6555-0114-1001-SI, 6555-1601-1002 SI, 6555-1601-1001-PI, 6555-0113-1101-PI, 6555-0104-1202 PI (6555-0101-1103 SI) 6555-0104-1102 PI, 6555-0115-1104 PI

GROUPED BY CHK.
DATES COMP. PART
HULL 613C GROUP NO.
KEY
TYPE OF DWG.

SCALE NONE =1 Ft.
DRAWN D.L. HOFFMAN
CHECKED H.M. EDGE
SECT. MGR. J. Johnson
TECH. APPROVAL NR
DATE COMPL. 11-12-6
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 11-12-76
CSD APPROVAL EEA for R.L. HARRINGTON

TITLE PIPING ARR H.P. STEAM DRAIN SYS ENG ROOM LIST OF MATERIAL 1002

DWG. NO. 6555-476
REV F
SHEET NO. 1 OF 28

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DDCo. DATE	NNS & DDCo. AUTH'D	OWNER DATE	OWNER APPD.
A	ALL	INITIAL ISSUE	11/12/6		—	-
B	3 4	ALTERED: QTY LINE 1 WAS 25'0"; QTY LINE 11 WAS 4; QTY LINE 13 WAS 2. DELETED LINE 15. DELETED LINES 15, 16, 17, & 18.	8/15/7			
C	22	LINES 7 & 11 CHG'D S/M FROM 6450-M29 ②	5/31/8		—	-
D	10 13 23	LINE 7 ALT'D DESCRIPTION; WAS STL 12 ↓ ↓ ↓ ↓ 2 GER	8/4/8	AC	—	-
E	6 16 20 23 25 27	ADDED LINES 12 THRU 14 ADDED LINES 6 THRU 12 ADDED LINES 14 & 15 ADDED LINES 14 & 15 ADDED LINES 17 ADDED LINES 15 THRU 17 GER				
	28	ADDED SHEET WORK DONE ON H613C GER				
	21 26	ALT'D S/M LINES 2, 6, 28 ALT'D S/M LINE 2 GER	10/4/8			
F	12 15 16 16A, 16B	QTY L.11 WAS 12'0", ADDED L.14. ADDED L'S 15 THRU 18. ADDED L'S 13 THRU 18. ADDED SHT 16A & 16B THE ABOVE ACCOMPLISHED ON 613C BY LIAISON NOS. 613C-SHJ-31 & 613C-SHJ-88.	2/21/9	AC		

NOTES

1. FOR ADDITIONAL INFORMATION ON MATERIAL DESCRIPTION SEE REF #1

NO.	REFERENCES	DWG. NO.
1	DIAGRAM DRAIN COLLECTING SYS - LIST	6555-465

HULL NO. 613C, 614C
DWG. NO. 6555-476
SHEET 2 OF

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	14'-0"	P5	1" IPS X STD STL PIPE	K57-06-104	PS	
	2	25'-0"	P6	3/4" IPS X X-HVY STL PIPE	K57-07-103		
	3	110'-0"	P7	1/2" ↓	K57-07-102		
	4	26'-0"	P8	3/4" IPS X X-HVY 1 1/4 CR-1/2 MO STL PIPE.	PO ⑪ 6440-C9	MD-PS	
	5						
	6						
	7	1	F15	3/4 ST TRAP W/STR SW STL (365 PSI)	PO ⑤ 6555-C1	MD-PS	
	8	1	F5	1/2" 90° ELL STL SW 3000#	S 25-60-006	ST-PS	
	9	2	F6	3/4" TEE SW 1 1/4 CR-1/2 MO STL 3000#	PO ① 6440-C4	MD-PS	
	10	2	F7	3/4" ST TRAP W/STR SW 1 1/4 CR-1/2 MO STL	PO ① 6555-C1		
B	11	3	F11	1/2" TEE SW STL 3000#	PO ① 608C-6450-C21		
	12	1	F18	1" x 1/2" x 1/2" TEE STL SW 3000#	PO ㊵ 6951-C3		
B	13	1	F21	3/4" ST TRAP W/STR SW STL (150# INLET)	PO ⑥ 6555-C1		
	14	1	F22	3/4" ST TRAP W/STR SW STL (207# INLET)	↓ ④		
B	15	~~1~~	~~F23~~	~~1" x 1" x 1/2" TEE STL SW 3000#~~	~~PO ㉞ 6951-C3~~		
	16	2	F28	1/2" COUPLING STL SW 3000#	⑨		
	17	8	F33	3/4" x 1/2" INSERT RED. SW. STL 3000#	㊳		
	18	1	F35	1" x 3/4 x 1/2" TEE STL SW 3000#	↓ ㊴		

REMARKS -

SERVICE - HP ST DRAINS
APPLICABLE HULLS 613C 614C
GROUP NO. PS-170 6555-0106-1001 SI SHT 1 OF 3
DWG NO. 6555-476 SHEET 3 REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V1375	1/2" GLOBE STOP SW 600# STL	PO ② 6450-C9	MD-PS	
	2	1	V1376	1/2" GLOBE STOP CHECK SW 600# STL	PO ① 6450 M29		
	3	1	V1377	1/2" GLOBE STOP SW 600# STL	PO ② 6450-C9		
	4	1	V1403	3/4" GLOBE STOP SW 900# 1 1/4 CR-1/2 MO STL	PO ② 6440-M7		
-	5	1	V1404	3/4" GLOBE STOP CHECK SW 900# 1 1/4 CR-1/2 MO STL	PO ⑥ 6440-M7		
	6	1	V1405	3/4" GLOBE STOP SW 900# 1 1/4 CR-1/2 MO STL	PO ② 6440-M7		
	7	1	V1412	3/4" ↓	↓		
	8	1	V1413	3/4" GLOBE STOP CHECK SW 900# 1 1/4 CR-1/2 MO STL	PO ⑥ 6440-M7		
	9	1	V1414	3/4" GLOBE STOP SW 900# 1 1/4 CR-1/2 MO STL	②		
	10	1	V1476	3/4"			
	11	1	V1477	3/4"			
	12	1	V1482	3/4"			
	13	1	V1483	3/4" ↓	↓		
	14	1	V1464	1/2" GLOBE STOP SW 600# STL	PO ② 6450 C9	↓	
B	15	~~1~~	~~V3017~~	~~1/2"~~ ↓	↓		
B	16	~~1~~	~~V3018~~	~~1/2" GLOBE STOP CHECK 600# STL SW~~	~~PO ② 6555-C6~~		
B	17	~~1~~	~~V3019~~	~~1/2" GLOBE STOP SW 600# STL~~	~~①~~		
B	18	~~1~~	~~V3020~~ ↓		~~①~~ ↓		

REMARKS -

SERVICE - HP STEAM DR SYS
APPLICABLE HULLS 613C 614C
GROUP NO. PS-170 6555-0106-1001 SI SHT 2 OF 3
DWG NO. 6555-476 SHEET 4 REV. B

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V3021	1/2" GLOBE STOP SW 600# STL	PO ① 6555-C6	MD-PS	
	2	1	V3022	1/2" GLOBE STOP CHECK SW 600# STL	②		
	3	1	V3023	1/2" GLOBE STOP SW 600# STL	①		
	4	1	V3024	1/2" ↓	↓		
	5	1	V3029	1/2" ↓	↓		
	6	1	V3030	1/2" GLOBE STOP CHECK SW 600# STL	②		
	7	1	V3031	1/2" GLOBE STOP SW 600# STL	①		
	8	1	V3032	1/2" ↓	↓ ↓		
	9						
	10						
	11	4	H-13	1" HANGER SWING TYPE SINGLE LEG W/LINER	S/ 25-48-346	ST-PS	
	12	15	H13	1/2" ↓	S/ 25-48-326		
	13	4	H13	3/4" ↓	S 25-48-336		
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - HP ST DRAINS
APPLICABLE HULLS 613C 614C
GROUP NO. PS-170 6555-0106-1001 SI SHT 3 OF 3
DWG NO. 6555-476 SHEET 5 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	35'-0"	P4	1 1/4" IPS x STD THK PIPE	K57-06-105	PS	
	2	75'-0"	P5	1" ↓ ↓	K57-06-104		
	3	72"	P6	3/4" IPS x "X"-HVY THK PIPE	K57-07-103		
	4	200'-0"	P7	1/2" ↓ ↓	K57-07-102		
	5						
	6						
	7						
	8						
	9						
	10						
	11						
E	12	1	H-57	1 1/4" SWING HGR	MO 283285 SH14L1	ST-PS	
E	13	1	H-57	1" SWING HGR	MO 283285 SH13L8		
E	14	1	H-57	1/2" SWING HGR	MO 283285 SH13L1	↓	
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - HP STEAM DR SYS
APPLICABLE HULLS 613C 614C
GROUP NO. PS-173 6555-0114-1001 SI SHT 1 OF 6
DWG NO. 6555-476 SHEET 6 REV. E

GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V1332	1/2" GLOBE STOP 600# SW C.STL	PO ④ 6450-M9	MD-PS	
	2	1	V1373	1/2"	PO ② 6450-C9		
	3	1	V1374	1/2"	↓ ↓		
	4	1	V3033	1/2"	PO ① 6555-C6		
	5	1	V3034	1/2" ↓ ↓	↓		
	6	1	V3035	1/2" GLOBE STOP CHK 600# SW C.STL	②		
	7	1	V3036	1/2" GLOBE STOP 600# SW C.STL	①		
	8	1	V3037	1/2"			
	9	1	V3038	1/2"			
	10	1	V3039	1/2" ↓ ↓	↓		
	11	1	V3040	1/2" GLOBE STOP CHK 600# SW C.STL	②		
	12	1	V3041	1/2" GLOBE STOP 600# SW C.STL	①		
	13	1	V3042	1/2"			
	14	1	V3043	1/2"			
	15	1	V3044	1/2" ↓ ↓	↓		
	16	1	V3045	1/2" GLOBE STOP CHK 600# SW C.STL	②		
	17	1	V3046	1/2" GLOBE STOP 600# SW C.STL	①		
	18	1	V3047	1/2" ↓ ↓	↓ ①		

REMARKS -

SERVICE - HP STEAM DR SYS
APPLICABLE HULLS 613C 614C
GROUP NO. PS-173 6555-0114-1001 SI SHT 2 OF 6
DWG NO. 6555-476 SHEET 7 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V3048	1/2" GLOBE STOP 600# SW C.STL	PO ① 6555-C6	MD-PS	
	2	1	V3049	1/2" GLOBE STOP CHK 600# SW C.STL	②		
	3	1	V3050	1/2" GLOBE STOP 600# SW C.STL	①		
	4	1	V3051	1/2"			
	5	1	V3052	1/2"			
	6	1	V3053	1/2" ↓ ↓	↓		
	7	1	V3054	1/2" GLOBE STOP CHK 600# SW C.STL	②		
	8	1	V3055	1/2" GLOBE STOP 600# SW C.STL	①		
	9	1	V3056	1/2"			
	10	1	V3057	1/2" ↓ ↓	↓		
	11	1	V3058	1/2" GLOBE STOP CHK 600# SW C.STL	②		
	12	1	V3059	1/2" GLOBE STOP 600# SW C.STL	①		
	13	1	V3060	1/2"	↓ ①		
	14	1	V1378	1/2" ↓ ↓	PO ② 6450-M9		
	15	1	V1379	1/2" GLOBE STOP CHK 600# SW C.STL	PO ① 6450-M29		
	16	1	V1380	1/2" GLOBE STOP 600# SW C.STL	PO ② 6450-M9		
	17	1	V1386	1/2" ↓ ↓	↓		
	18	1	V1387	1/2" GLOBE STOP CHK 600# SW C.STL	PO ② 6450-M29		

REMARKS -

SERVICE - HP STEAM DR SYS
APPLICABLE HULLS 613C 614C
GROUP NO. PS 173 6555-0114-1001 SI SHT 3 OF 6
DWG NO. 6555-476 SHEET 8 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V1388	1/2" GLOBE STOP 600# SW C.STL	PO ④ 6450-M9	MD-PS	
	2	1	V1465	1/2"	PO ② 6450-M9		
	3	1	V1467	1/2"	PO ④ 6450-M9		
	4	1	V1471	1/2" ↓ ↓	↓		
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - HP STEAM DR SYS
APPLICABLE HULLS 613C 614C
GROUP NO. PS 173 6555-0114-1001 SI SHT 4 OF 6
DWG NO. 6555-476 SHEET 9 REV. A

6555-476

MICRO-MASTER® 105 mm
K+E

SEPT. '80
FRAME
8X

6555-476

SEPT. '80

FRAME

8X

GROUP

REV.	LINE NO.	QTY. (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	F1	LEVEL CONTROL PILOT FOR V1303	PO (12a) 6555-C5	MD-PS	
	2	1	F2	SUPPORT FOR F1 (2"IPS X STD WT STL PIPE L=12")	K 57-06-107	PS	
	3	1	F3	RESERVOIR STL ASSY 98 257338	MD 257338 S2 L7	ST-PS	
	4	2	F4	1/2" UNION STL SW	PO ㉛ 6951-C3	MD-PS	
	5	5	F5	1/2" ELL 90° STL SW 3000#	S/ 25-60-006	ST-PS	
	6	8	F11	1/2" TEE STL SW 3000#	PO ① 608C-6450 C21	MD-PS	
D	7	5	F17	3/4" TRAP SW CR-MOLY STL W/INTEGRAL STR (BLR PRESS ST)	PO ② 6555-C1		
	8	1	F18	1"x1/2"x1/2" TEE STL SW 3000#	PO ㊵ 6951-C3		
	9	1	F23	1"x1"x1/2" TEE STL SW 3000#	㉞		
	10	1	F25	1"x1/2"x3/4" TEE STL SW 3000#	㉜		
	11	1	F26	1 1/4"x1 1/4"x 1/2" TEE STL SW 3000#	㉟		
	12	1	F27	1 1/4"x 1"x1 1/4" TEE STL SW 3000#	㊱		
	13	5	F28	1/2" COUPLING STL SW 3000#	⑨		
	14	1	F30	1" COUPLING STL SW 3000#	③		
	15	1	F31	1 1/4"x1"x 3/4" TEE SW STL 3000#	㊲		
	16	3	F32	1 1/4" COUPLING STL SW 3000#	⑳		
	17	16	F33	3/4x1/2" INSERT RED STL SW	㊳		
	18	1	F21	3/4" TRAP SW STL W/ INTEGRAL STR 150#	PO ⑥ 6555-C1		

REMARKS -

SERVICE - HP STEAM DR SYS

GROUP NO. PS-173 6555-0114-1001 SI SHT 5 OF 6

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 10 REV. D

GROUP

REV.	LINE NO.	QTY. (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	F16	3/4" TRAP SW STL W/ INTEGRAL STR	PO ⑤ 6555-C1	MD-PS	
	2	1	F34	3/4" TRAP SW STL W/ INTEGRAL STR 220#	PO ④ 6555-C1		
	3						
	4						
	5						
	6	4	H13	1 1/4" HANGER SWING TYPE SINGLE LEG W/LINER	S/ 25-48-356	ST-PS	
	7	7	H-13	1"	S/ 25-48-346		
	8	8	H13	3/4"	S/ 25-48-336		
	9	20	H13	1/2"	S/ 25-48-326		
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - HP STEAM DR SYS

GROUP NO. PS-173 6555-0114-1001 SI SHT 6 OF 6

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 11 REV. A

INSTALLATION GROUP

REV.	LINE NO.	QTY. (1 SHIP)	PIPE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P1B	4" IPS X STD STL PIPE	PMO 6555-477	PS	
	2	1	P1C	4"			
	3	1	P1D	4"			
	4	1	P1E	4"			
	5	1	P2X	3"			
	6	1	P2W	3"			
	7	1	P2V	3"			
	8	1	P2U	3"			
	9						
	10						
F	11	50'-0"	P6	3/4 IPS X X-HVY STL PIPE	K57-07-103	PS	
	12	70'-0"	P7	1/2"	K57-07-102		
	13	15'-0"	P8	3/4" IPS X X-HVY 1 1/4 CR-1/2 MO STL PIPE	PO ① 6440-C9	MD-PS	
F	14	18'-0"	P9	1/4" IPS X X-HVY STL PIPE	S/ 57-07-100	ST-PS	
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - HP ST DRAINS

GROUP NO. PS-190 6555-1601-1002 SI SHT 1 OF 5

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 12 REV. F

INSTALLATION GROUP

REV.	LINE NO.	QTY. (1 SHIP)	FITTING NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	F2	SUPPORT FOR F12 (2"IPS X STD STL PIPE L=12")	K57-06-107	PS	
	2	2	F3	RESERVOIR STL SW.	MD 257338 S2 L7	ST-PS	
	3	4	F4	1/2" UNION STL SW	PO ㉛ 6951-C3	MD-PS	
	4	2	F6	3/4" TEE SW 1 1/4 CR-1/2 MO STL 3000#	PO ① 6440-C4		
	5	2	F7	3/4" ST TRAP SW W/STR 1 1/4 CR-1/2 MO STL	PO ① 6555-C1		
	6	1	F8	GAGE GLASS ASSY (4TH STG FD HTR)	PO ① 6552-C8		
	7	1	F9	GAGE GLASS ASSY (5TH STG FD HTR)	②		
	8	3	F11	1/2" TEE SW STL 3000#	PO ① 608C-6450-C21		
	9	1	F12	LEVEL CONTROL PILOT FOR V1318	PO (7a) 6555-C5		
	10	1	F13	LEVEL CONTROL PILOT FOR V1326	PO (8a) 6555-C5		
	11	1	F14	SUPPORT FOR F13 (2"IPS X STD STL PIPE L=20")	K57-06-107	PS	
D	12	2	F17	3/4" ST TRAP SW W/STR CR-MOLY STL (BLR PRESS)	PO ② 6555-C1	MD-PS	
	13	1	F24	3/4" ST TRAP SW W/STR STEEL (150#)	⑥		
	14	6	F33	3/4" x 1/2" INSERT RED STL SW 3000#	PO ㊳ 6951-C3		
	15	6	F36	4" BACKING RING STL STD	S/ 97-18-131	ST-PS	
	16	6	F37	3"	S/ 97-18-126		
	17	2	F10	3/4" 90° ELL STL SW 3000#	S/ 25-60-007		
	18						

REMARKS -

SERVICE - HP ST DRAINS

GROUP NO. PS 190 6555-1601-1002 SI SHT 2 OF 5

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 13 REV. D

GROUP

REV.	LINE NO.	QTY. (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V1315	1/2" GLOBE STOP 600# SW C.STL	PO ② 6450-M9	MD-PS	
	2	1	V1316	1/2"			
	3	1	V1317	1/2"			
	4	1	V1323	1/2"			
	5	1	V1324	1/2"			
	6	1	V1325	1/2"			
	7	1	V1383	1/2"			
	8	1	V1384	1/2" GLOBE STOP CHK 600# SW C.STL	PO ⑥ 6450-M29		
	9	1	V1385	1/2" GLOBE STOP 600# SW C.STL	PO ④ 6450-M9		
	10	1	V1389	1/2"			
	11	1	V1390	1/2" GLOBE STOP CHK 600# SW C.STL	PO ② 6450-M29		
	12	1	V1391	1/2" GLOBE STOP 600# SW C.STL	PO ④ 6450-M9		
	13	1	V1406	3/4" GLOBE STOP 900# 1 1/4 CR-1/2 MO SW	PO ② 6440-M7		
	14	1	V1407	3/4" GLOBE STOP CHK 900# 1 1/4 CR-1/2 MO SW	PO ⑥ 6440-M7		
	15	1	V1408	3/4" GLOBE STOP 900# 1 1/4 CR-1/2 MO SW	PO ② 6440-M7		
	16	1	V1429	3/4"			
	17	1	V1430	3/4" GLOBE STOP CHK 900# 1 1/4 CR-1/2 MO SW	PO ⑥ 6440-M7		
	18	1	V1431	3/4" GLOBE STOP 900# 1 1/4 CR-1/2 MO	PO ② 6440-M7		

REMARKS -

SERVICE - HP STEAM DR SYS

GROUP NO. PS-190 6555-1601-1002 SI SHT 3 OF 5

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 14 REV. A

GROUP

REV.	LINE NO.	QTY. (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V1432	3/4" GLOBE STOP 900# 1 1/4 CR-1/2 MO SW	PO ② 6440-M7	MD-PS	
	2	1	V1433	3/4"			
	3	1	V1466	1/2" GLOBE STOP 600# SW C.STL	PO ④ 6450-M9		
	4	1	V1470	1/2"			
	5	1	V1472	1/2"			
	6	1	V1479	3/4" GLOBE STOP 900# 1 1/4 CR-1/2 MO SW	PO ② 6440-M7		
	7	1	V1480	3/4"			
	8	1	V3025	1/2" GLOBE STOP 600# SW C.STL	PO ① 6555-C6		
	9	1	V3026	1/2" GLOBE STOP CHK 600# SW C.STL	②		
	10	1	V3027	1/2" GLOBE STOP 600# SW C.STL	①		
	11	1	V3028	1/2"	①		
	12	1	V1314	1/2"x3/4" RELIEF VLV 300# FLG'D STL	PO ㊻ 6450-C7		
	13	1	V1322	1/2"x3/4"	㊼		
	14	1	V1468	1/2" GLOBE STOP 600# SW C.STL	PO ④ 6450-M9		
F	15	2	F44	3/4x3/4x1/2 RED TEE STL S.W. 3000#	S/ 25-60-224	ST-PS	
F	16	2	F45	3/4" UNION STL 3000# SCR'D	S/ 25-12-196		
F	17	2	F46	1/2" BOSS STL	S/ 25-17-352		
F	18	1	F47	ORIFICE 3/8"THK STL 3/16" SQ EDGE	MO 216670 S.14. L.3		

REMARKS -

SERVICE - HP STEAM DR SYS

GROUP NO. PS-190 6555-1601-1002 SI SHT 4 OF 5

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 15 REV. F

INSTALLATION GROUP

REV.	LINE NO.	QTY. (1 SHIP)	ITEM NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	7	H13	4" HANGER SWING TYPE SINGLE LEG W/LINER	S/ 25-48-416	ST-PS	
	2	7	H13	3"	S/ 25-48-396		
	3	2	H13	3/4	S/ 25-48-336		
	4	10	H13	1/2	S/ 25-48-326		
F	5	1	F48	ORIFICE 3/8"THK STL 3/16" SQ EDGE	MO 216670 S.14 L.2		
E	6	2	F300	4"x2.66x7.7#/FT STL I-BEAM L=60"	S/ 73-08-204	PS	
E	7	1	TR-2	3" TIE ROD HGR	MO 283286 SH 11 L 7	ST-PS	
E	8	1	TR-3	4" TIE ROD HGR	MO 283286 SH 11 L 13		
E	9	1	SH-1	3"SPRING HGR VERT MOVE UP.85" HOT LOAD 300#	PO 6552-C16 (51) * PO 6552-C16 ㊼ Δ		
E	10	1	SH-2	4"SPRING HGR UP.85" 350#	PO 6552-C16 ㊻ * PO 6552-C16 ㊽ Δ		
E	11	1	SH-3	3"SPRING HGR DN.41" 300#	PO 6552-C16 (57) * PO 6552-C16 (52) Δ		
E	12	1	SH-4	4"SPRING HGR DN.41" 400#	PO 6552-C16 ㊹ * PO 6552-C16 ㊼ Δ		
F	13	2	F38	3/4"x3/4"x1/4 RED. TEE STL S.W.	S/ 25-60-226	ST-PS	
	14	2	F39	3/4"x1" INSERT RED. STL S.W.	S/ 25-60-368		
	15	1	F40	ORIFICE 3/8"THK STL 3/16" SQ EDGE	MO 216670 S.14 L.4		
	16	1	F41	3/4" BOSS STL SW.	S/ 25-02-224		
	17	4	F42	3/4" FLG 300# SW	S/ 25-18-833		
	18	2	F43	3/4" TEE STL SW 3000#	S/ 25-60-078		

REMARKS -
* H613C
Δ H614C } X-42 TO REPLACE CLAMP & OTHER MAT'L

SERVICE - HP ST DRAINS

GROUP NO. PS-190 6555-1601-1002 SI SHT 5 OF 5

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 16 REV. F

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	12	25	3/4"	BOLTS	5/8 HVY HEX HD L=2 5/8	6000-C7 (61)	ST-PS	
	2	12			NUTS	5/8" HVY HEX	6000-C12 ⑬		
	3	6			GSKT	1/16" COMP. ACBESTOS	15-01-236		
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - H.P. ST DRAINS

GROUP NO. 6555-1601-1002-SI

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 16A REV. F

GROUP

REV.	LINE NO.	QTY. (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V-3143	3/4" GLOBE STOP STL S.W 600#	S/ 26-09-276	ST-PS	
	2	1	V-3144	1/4"	260		
	3	1	V-3145	3/4"	276		
	4	1	V-3146	1/4"	260		
	5	1	V-3147	3/4"	276		
	6	1	V-3148	1/4"	260		
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE -

GROUP NO. 6555-1601-1002-SI

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 16B REV. F

6555-476

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

FRAME

8X

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P1A	4"x3" IPS x STD STL PIPE	PMO 6555-477	PS	
	2						
	3						
	4						
	5		VALVE No				
	6	1	V1304	3" SWING CHECK 150# FLANGED STL	FURN WITH PIPE DET ON 6555-477	PS	
	7	1	V1330	4"			
	8						
	9						
	10	1	H13	4" HANGER SWING TYPE SINGLE LEG W/LINER	S/ 25-48-416	ST-PS	
	11	1	H13	3"	S/ 25-48-396		
	12						
	13						
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - HP ST DRAIN SYS

PS- 168

GROUP NO.

6555-1601-1001 PI SHT 1 OF 2

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 17 REV. A

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	8	Z1	4" 150#	BOLTS	5/8" HVY HEX HD STL L= 3"	PO 6000-C7 ㉕	MD-PS	
	2	8			NUTS	5/8" HVY HEX STL	PO 6000-C11 ②		
	3	1			GSKT	1/16" THK COMP ASBESTOS	S/75-01-278E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - H.P. ST DRAINS

PS- 168

GROUP NO.

6555-1601-1001 PI SHT 2 OF 2

APPLICABLE HULLS 613C 613C

DWG NO. 6555-476 SHEET 18 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P1F	4" IPS x STD STL PIPE	PMO 6555-477	PS	
	2	1	P2G	3"			
	3	1	P2H	3"			
	4						
	5						
	6						
	7		FLANGE NO				
	8	1	J1	3" FLG 300# SLIP-ON STL	PO ⑭ 6450-C42	MD-PS	
	9	1	J2	2 1/2" FLG 300# SLIP-ON STL	PO ㉖ 6450-C2		
	10						
	11						
	12						
	13		FITTING No				
	14	1	F37	3" BACKING RING STD	S/ 97-18-126	ST-PS	
	15	1	H13	4" HANGER SWING TYPE SINGLE LEG W/LINER	S/ 25-48-416		
	16	2	H13	3"	S 25-48-396		
	17						
	18						

REMARKS -

SERVICE - HP STEAM DR SYS

PS- 152

GROUP NO.

6555-0113-1101 PI SHT 1 OF 3

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 19 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V1318	2" LEVEL CONTROL 300# FLG'D C.STL	PMO 6555-477	PS	
	2	1	V1319	2" GATE VLV 300# FLG'D C.STL			
	3	1	V1320	2"			
	4	1	V1321	2 1/2" GLOBE STOP 300# FLG'D C.STL			
	5	1	V1326	2" LEVEL CONTROL 300# FLG'D C.STL			
	6	1	V1327	2" GATE VLV 300# FLG'D C.STL			
	7	1	V1328	2"			
	8	1	V1329	2 1/2" GLOBE STOP 300# FLG'D C.STL			
	9	1	V1331	3" GLOBE STOP 300# FLG'D C.STL			
	10	1	V1340	3"			
	11						
	12						
	13						
E	14	1	TR-1	3" TIE ROD HGR	MO 283285 SH11 L1	ST-PS	
E	15	1	H-57	4" SWING HGR	MO 283285 SH15 L1		
	16						
	17						
	18						

REMARKS -

SERVICE - HP STEAM DR SYS

PS- 152

GROUP NO.

6555-0113-1101 PI SHT 2 OF 3

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 20 REV. E

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	8	Z2	4" 300#	BOLTS	STUDS 3/4" ALLOY STL L= 4 1/2"	S/21-18-568	ST-PS	
E	2	16			NUTS	3/4" HVY HEX STL GR 4	S/21-31-104	MD-PS	
	3	1			GSKT	1/16 THK COMP ASBESTOS	S/15-01-248E	ST-PS	
	4	16	Z3	3" 300#	BOLTS	STUDS 3/4" ALLOY STL L=4 1/4"	S/21-18-566		
E	5	32			NUTS	3/4" HVY HEX STL GR4	S/21-31-104	MD-PS	
	6	2			GSKT	1/16" COMP ASBESTOS	S/15-01-244E	ST-PS	
	7	8	Z4	2 1/2" 300#	BOLTS	STUDS 3/4" ALLOY STL L=4"	S/21-18-564		
E	8	16			NUTS	3/4" HVY HEX STL GR4	S/21-31-104	MD-PS	
	9	1			GSKT	1/16" COMP ASBESTOS	S/15-01-242E	ST-PS	
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - HP STEAM DR SYS

PS- 152

GROUP NO.

6555-0113-1101 PI SHT 3 OF 3

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 21 REV. E

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	44'-0"	P5	1" IPS x STD STL PIPE	K57-06-104	PS	
	2	15'-0"	P7	1/2" IPS x X-HVY STL PIPE	K57-07-102		
	3						
	4		VALVE No				
	5	1	V1392	1/2" GLOBE STOP SW 600# STL	PO ④ 6450-M9	MD-PS	
	6	1	V1393				
C	7	1	V1394	1/2" GLOBE STOP CHECK SW 600# STL	PO ② 6450-M29		
	8	1	V1395	1/2" GLOBE STOP SW 600# STL	PO ④ 6450-M9		
	9	1	V1469				
	10	1	V3013				
C	11	1	V3014	1/2" GLOBE STOP CHECK SW 600# STL	PO ② 6450-M29		
	12	1	V3015	1/2" GLOBE STOP SW 600# STL	PO ④ 6450-M9		
	13	1	V3016				
	14						
	15						
	16						
	17						
	18						

REMARKS -

SERVICE - HP ST DRAINS

PS- 148

GROUP NO.

6555-0104-1202 PI SHT 1 OF 2

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 22 REV. C

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	FITTING No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	2	F11	1/2" TEE STL SW 3000#	PO ① 608C 6450-C21	MD-PS	
D	2	1	F17	3/4" STEAM TRAP W/STR CR-MOLY SW (BLR PRESS) STL	PO ② 6555-C1		
	3	1	F18	1"x1/2"x1/2" TEE STL SW 3000#	PO ㊵ 6951-C3		
	4	1	F20	3/4" STEAM TRAP W/STR STL SW (ST TO STRIP PUMP)	PO ⑥ 6555-C1		
	5	2	F30	1" COUPLING STL SW 3000#	PO ③ 6951-C3		
	6	4	F33	3/4"x1/2" INSERT RED. STL SW 3000#	㊳		
	7						
	8						
	9						
	10	5	H13	1" HANGER SWING TYPE SINGLE LEG W/LINER	S/ 25-48-346	ST-PS	
	11	3	H13	1/2"	S/ 25-48-326		
	12						
	13						
E	14	1	RH-1	1" ROD HANGER	MO 283285 SH12 L13	ST-PS	
E	15	1	RH-2	1" ROD HANGER	MO 283285 SH12 L16		
	16						
	17						
	18						

REMARKS -

SERVICE - HP ST DRAIN SYS

PS 148

GROUP NO.

6555-0104-1202 PI SHT 2 OF 2

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 23 REV. E

INSTALLATION GROUP

REV.	LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	P2Y	3" IPS x STD STL PIPE	PMD 6555-477	PS	
	2	1	P2J				
	3	1	P2K				
	4	1	P2L				
	5	1	P2M				
	6	1	P2N				
	7						
	8						
	9	72"	P4	1 1/4" IPS x STD STL PIPE	K57-06-105	PS	
	10	20'-0"	P5	1" IPS x STD STL PIPE	K57-06-104		
	11	25'-0"	P7	1/2" IPS x "X" HVY STL PIPE	K57-07-102		
	12						
	13		FITTING No				
	14	1	F18	1"x1/2"x1/2" TEE STL SW 3000#	PO ㊵ 6951-C3	MD-PS	
	15	1	F19	1 1/4"x1"x1"	㉝		
	16	6	F37	3" BACKING RING STL STD	S/ 97-18-126	ST-PS	
	17						
	18						

REMARKS -

SERVICE - HP STEAM DR SYS

PS- 148

GROUP NO.

6555-0104-1102 PI SHT 1 OF 3

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 24 REV. A

GROUP

REV.	LINE NO.	QTY (1 SHIP)	VALVE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	1	V1300	3" GLOBE STOP 300# FLG'D STL	PMO 6555-477	PS	
	2	1	V1301	3" GLOBE STOP CHECK 300# FLG'D STL			
	3	1	V1302	3"			
	4	1	V1303	2" LEVEL CONTROL 300# FLG'D STL			
	5						
	6						
	7						
	8						
	9						
	10						
	11	10	H13	3" HANGER SWING TYPE SINGLE LEG W/LINER	S/ 25-48-396	ST-PS	
	12	1	H13	1 1/4"	S/ 25-48-356		
	13	2	H13	1"	S 25-48-346		
	14	3	H13	1/2"	S 25-48-326		
	15						
	16						
E	17	2	H-57	3" SWING HGR	MO 283285 SH14 L8	ST-PS	
	18						

REMARKS -

SERVICE - HP STEAM DR SYS

PS 148

GROUP NO.

6555-0104-1102 PI SHT 2 OF 3

APPLICABLE HULLS 613C 614C

DWG NO. 6555-476 SHEET 25 REV. E

6555-476

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
FRAME
8X

FLANGED JOINT LIST & GROUP

REV.	LINE	QTY (1 SHIP)	JOINT NO.	JOINT SIZE		DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
	1	8	Z3	3" 300#	BOLTS	STUD 3/4" ALLOY STL L=4 1/4"	S/21-18-566	ST-PS	
E	2	16			NUTS	3/4" HVY HEX STL GR4	S/21-31-104	MD-PS	
	3	1			GSKT	1/16" THK COMP ASB	S/15-01-244E	ST-PS	
	4				BOLTS				
	5				NUTS				
	6				GSKT				
	7				BOLTS				
	8				NUTS				
	9				GSKT				
	10				BOLTS				
	11				NUTS				
	12				GSKT				
	13				BOLTS				
	14				NUTS				
	15				GSKT				
	16				BOLTS				
	17				NUTS				
	18				GSKT				
	19				BOLTS				
	20				NUTS				
	21				GSKT				
	22				BOLTS				
	23				NUTS				
	24				GSKT				
	25				BOLTS				
	26				NUTS				
	27				GSKT				
	28				BOLTS				
	29				NUTS				
	30				GSKT				
	31				BOLTS				
	32				NUTS				
	33				GSKT				
	34				BOLTS				
	35				NUTS				
	36				GSKT				
	37				BOLTS				
	38				NUTS				
	39				GSKT				

REMARKS -

SERVICE - HP STEAM DR SYS

PS 148

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0104-1102 PI SHT 3 OF 3

DWG NO. 6555-476 SHEET 26 REV. E

INSTALLATION GROUP

REV.		LINE NO.	QTY (1 SHIP)	PIPE No	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	P2P	3" IPS X STD STL PIPE	PMD 6555-477	PS	
		2	1	P2Q	↓	↓	↓	
		3	1	P2R	↓	↓	↓	
		4	1	P2S	↓	↓	↓	
		5	1	P2T	↓	↓	↓	
		6						
		7						
		8						
		9		FITTING No				
		10	6	F37	3" BACKING RING STL STD	S 97-18-126	ST-PS	
		11						
		12						
		13		H13	3" HANGER SWING TYPE SINGLE LEG W/LINER	S/ 25-48-396	ST-PS	
		14						
E		15	1	TR-4	3" TIE ROD HGR	MO 283285 SH12L1	ST-PS	
E		16	1	TR-5	3" TIE ROD HGR	MO 283285 SH12L7	↓	
E		17	1	SH-5	3" SPRING HGR · VERT MOVE UP .67" · HOT LOAD 225#	PO 6552-C16 ⑬ * PO 6552-C16 ⑧ Δ	↓	
		18						

REMARKS - * H613C ONLY } X-42 TO REPLACE CLAMP & OTHER
Δ H614C ONLY } MAT'L

SERVICE - HP STEAM DR SYS

PS-152

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0115-1104 PI SHT 1 OF 1

DWG NO. 6555-476 SHEET 27 REV. E

INSTALLATION GROUPS

REV.	LINE	ITEM NO.	QTY (1 SHIP)	FTG NO	DESCRIPTION	MAT'L SOURCE	ROUTING	MAT'L RECORD
		1	1	F108	1"x1"x1/2" TEE SW STL 3000#	S/ 25-60-235	ST-PS	
		2	5	F200	1/2" 90° ELL SW STL 3000#	S/ 25-60-006	↓	
		3	1	F201	1/2" TEE SW STL 3000#	S/ 25-60-077	↓	
		4	1	F202	3/4" STM TRAP SW STL	PO ⑥ 6555-C1	↓	
		5	2	F203	3/4"x1/2" INS RED SW STL	S/ 25-60-364	↓	
		6						
		7		PIPE NO				
		8	50'-0"	P7	1/2" IPS x "X" HVY PIPE STL	S/ 57-07-102	PS	
		9						
		10		VLV NO				
		11	1	V-3131	1/2" GLOBE STOP VLV SW STL 600#	S/ 26-09-275	ST-PS	
		12	1	V-3132	1/2" GLOBE STOP CHK VLV SW STL 600#	PO ② 6555-C6	↓	
		13	1	V-3133	1/2" GLOBE STOP VLV SW STL 600#	S/ 26-09-275	↓	
		14	1	V-3134	1/2" ↓	↓	↓	
		15						
		16		HGR NO				
		17	8	H-12	1/2" SWING HGR	S/ 25-47-326	ST-PS	
		18						

REMARKS -

SERVICE - HP STM DRN

PS-156

APPLICABLE HULLS	613C	614C	GROUP NO.	6555-0101-1103 SI SHT 1 OF 1

DWG NO. 6555-476 SHEET 28 REV. E

6800.62

CSD VAULT
E

REPRODUCTION OFFICE
YARD PRINTS YES
REMARKS ISSUE REV. B
GROUPING NO
DATE 1-5-78
SIGNED

FIRST ISSUE	DEPT.	NO. PRTS.	REV.	DATE ISSUED	SPECIAL PRINTS
2-2-77		6	A	2-2-77	
			B	1-11-78	

YARD PRINTS

ORDERED BY DESIGN

CSDV 1
K50 1

REVISIONS — REFER TO SHEET NO. ____

REV. STATUS OF SHEETS												
	REV.	B	B	A	A	A	A	A	B	A	A	A
	SHEET	1	2	3	4	5	6	7	8	9	10	11

GROUP ——
MC NO. 158

NNS&DDCo HULL No.	MARAD HULL No.	USMA DESIGN	SHIP'S NAME
615C	311		
614C	310		
613C	309	T11-S-1164	

DWG. REV. — HULL APPLIC.

REV.	613C	614C	615C
A	Yes	Yes	Yes
B	Yes	Yes	Yes

APPROVALS
OWNERS
ABS
USCG

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division
FSCM NO. 43689

COMMERCIAL SHIP ENGINEERING

SCALE NONE =1 Ft.
DRAWN T. H. KOGER, JR.
CHECKED
SECT. MGR. W.R. Schellenberg
DATE COMPL. 1-14-77
EXAMINED
AUTHORIZED E.E. Stephenson
DATE 1-14-77
TECH. APPROVAL W.H. FELTON
CSD APPROVAL EEA for R.L. HARRINGTON

GROUPED BY CHK.
DATES PART COMP.
HULL KEY GROUP NO.
TYPE OF DWG.

TITLE PROCEDURE FOR CARE OF BOILERS-ALKALINE BOIL-OUT, WET LAYUP, FEEDWATER & BOILER WATER CHEMISTRY PROGRAM

DWG. NO. 6800-62 REV B SHEET NO. 1 OF 11

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APPD.
A	-	INITIAL ISSUE				
B	8	ON SHT 8 CHANGED CHEMICAL FOR CONTROLLING Ph LEVEL TO SODIUM HYDROXIDE IN LIEU OF TRISODIUM PHOSPHATE TO SUIT MAT'LS. LAB COMMENTS	1-5-78 THK			

NO.	REFERENCES	DWG. NO.
1	TECHNICAL MANUAL FOR COMBUSTION ENGINEERING, INC., TYPE V2M-8 MAIN BOILERS & ACCESSORIES	C.E. 36471

I GENERAL

1. This procedure covers all the operations necessary to depreserve the main propulsion boilers after installation aboard ship and to maintain the waterside of the boilers in an acceptable condition after depreservation and until delivery of the ship.
2. This procedure includes initial boil-out to remove vendor applied Tectyl - #502-C preservation from waterside surfaces, care of the boilers by wet layup after depreservation, and boiler and feedwater chemistry during boiler operation.
3. The feed and condensate piping systems should be cleaned before boiling out the boiler in order to minimize the amount of oil, grease and foreign matter that can be introduced into the boiler from the pre-boiler system following startup.
4. Just prior to shipboard testing, each boiler, superheater and control desuperheater shall be given an alkaline boil-out in accordance with Sections II and III.
5. The superheater shall be boiled-out concurrently with the boiler. The control desuperheater and steam drum internals and auxiliary steam desuperheater shall be cleaned in the shop. Alkaline boil-out of the boiler and superheater shall be accomplished prior to installation of the desuperheaters and drum internals.
6. After boil-out and replacement of desuperheaters and drum internals, the boiler shall be filled with deaerated feedwater for immediate steaming or placed in wet lay-up in accordance with Section IV until steaming begins.
7. While steaming, the boiler water and feedwater chemistry shall be kept under strict control in accordance with Section V.

II ALKALINE BOIL-OUT OF BOILER

Each boiler shall be boiled-out for the purpose of removing oil, grease and preservatives from the watersides in accordance with the following procedure. Boil-out of the superheater in accordance with Section III shall be accomplished simultaneously.

---

1. Pipe the boiler with temporary connections, pipe, mixing tank, necessary cutout valves and drains and connect to 100 psig shipyard steam system in a manner which will enable venting from the top and boiling out from the bottom. System must include catch tank for oil water and caustic. Blank off the boiler safety valves. Blank off gages and secure valves which will not be used. The regular water gage should not be used during boil-out. The water column should be replaced by a temporary boil-out glass, or a temporary water gage may be installed. Remove all dessicant or temporary drying agents in steam or water drums.
2. Introduce yard steam into steam drum via convenient connections, draining out lower header to catch tank. Heat up entire boiler and blow down to melt and drain all oil and/or preservatives possible prior to caustic cleaning.
3. The boil-out solution shall consist of two percent by weight of Oakite 162 and distilled water. The required quantities for each boiler are 5050 gallons of water and 838 pounds of Oakite 162.
4. Add a concentrated solution of Oakite 162 and distilled water to the boiler. Fill the boiler to the steaming level with distilled water.
5. Supply steam to the water drum and all lower water wall headers. Maintain a pressure of 50 to 100 psig for at least 24 hours. Permit the steam drum to vent continuously, but restrict the flow so as not to blow out the boil-out solution. All solution drained or blown out must be directed to drain or catch tank.
6. After the 24 hour boiling-out period, and when the overflow from the steam drum vents appears to be clear, check the overflow for alkalinity using phenolphtalein as the indicator. If the phenolphthalein turns pink, the overflow must continue until tests show the phenolphthalein indicator is neutral (does not turn pink). When the overflow is proven to be neutral and the superheater boil-out procedure has been completed, secure the heating system and blow down the boiler by using the surface and bottom blow and drains.
7. The boiler shall be completely drained by steam displacement.
8. When the steam drum metal temperature drops to approximately 200°F, open the steam drum manhole and, if necessary to remove residue, flush out the boiler with a high velocity steam of hot (170-180°F) fresh water followed by a thorough rinse with hot (170-180°F) distilled water.

---

9. Open and inspect the watersides of the boiler. If they are not cleaned to the satisfaction of the Machinery Installation Department and the Commercial Ship Engineering Department, the boil-out procedure shall be repeated.
10. Close up boiler.

III ALKALINE BOIL OUT OF SUPERHEATER AND CONTROL DESUPERHEATER

Each superheater and control desuperheater shall be boiled-out for the purpose of removing oil, grease and preservatives from the watersides in accordance with the following procedure. Boil-out of the superheater shall be accomplished concurrently with cleaning of the boiler in accordance with Section II.

1. With the control desuperheater coil removed, pipe up a temporary spool piece inside the steam drum between the control desuperheater inlet and outlet flange connections. Provide a pump connected by temporary fittings and arranged to take suction from the steam drum feedwater inlet connection and discharge to the superheater outlet header drain. The pump shall have a capacity of approximately 100 GPM. The superheater outlet header drain shall also be piped by temporary connection to the boil-out solution supply tank and to the 100 psig shipyard steam system. As an alternate, the steam may be supplied through special fittings temporarily installed in superheater header handholes immediately adjacent to the outlet header drain.
2. The boil-out solution shall consist of two percent by weight of Oakite 162 and distilled water. The required quantities are 1000 gallons of water and 166 pounds of Oakite 162.
3. Open the steam drum vent and blow out the superheater with steam for approximately thirty minutes to expel the air from the vertical superheater. Close steam drum vent.
4. Immediately after blowing out the superheater, add the boil-out solution. The solution tank should be located an at elevation above the steam drum. The solution will cause the steam to condense, thus completely filling the superheater.

---

5. Supply steam to the superheater outlet header and open the steam drum vent. Maintain a pressure of 50 to 100 psig for at least 24 hours.
6. Use the temporary pump to continuously circulate the solution through the superheater and saturated steam pipe to the boiler steam drum.
7. After the 24 hour boil-out period, draw a solution sample from the superheater inlet header drain and check the solution for alkalinity using phenolphthalein as the indicator. If the phenolphthalein turns pink, the boil-out shall continue. When the solution is proven to be neutral, secure the heating steam and the circulating pump and blow down the superheater and control desuperheater with steam.
8. Open and inspect the superheater. If the superheater is not cleaned to the satisfaction of the Machinery Installation Department and the Commercial Ship Engineering Department, the boil-out procedure shall be repeated.
9. Close up superheater.

IV WET LAY-UP

A. Short Term Securing of Boiler

1. When steaming, the boiler shall be secured overnight or over weekends by using the steam blanket method. This consists of securing fires when at operating pressure and then securing all feed supply and steam valves. Although the pressure will drop during the idle period, any positive pressure is considered satisfactory.
2. During a short term securing of the boiler, the deaerating feed heater shall be secured and started-up as follows:
   (a) Securting the DFT
   A positive steam pressure shall be held overnight or over a weekend when steaming or the boiler is scheduled to be re-steamed.
   (b) Starting up the DFT
   Warming up of the DFT shall be started at least one hour before lighting off the boiler. Re-circulate the water from and to the DFT. At the start of the warm-up, the DFT vent system shall be opened and kept in operation until the unit is again secured.

B. Long Term Securing of Boilers (Nitrogen Blanket)

If the boiler is to be secured for longer than two days, the following procedure shall be employed:

1. The boiler shall be secured as in the above procedure and allowed to cool.
2. When pressure has dropped to about 25 psig, the boiler steam drum shall be completely filled with hot deaerated feedwater from the DFT. (Do not fill the superheater.)
3. During the topping off, water in the boiler shall be recirculated and chemicals shall be added to bring the water chemistry within the limits specified in Section V.
4. Nitrogen shall be admitted at approximately 100 psig through the superheater outlet connection and the boiler shall be blown down to the steaming level.
5. A positive nitrogen blanket of at least 50 psig shall be maintained during the entire lay-up period.
6. The Materials Engineering Department shall monitor the boiler water chemistry and maintain boiler water treatment records as required by Section V.
7. Care shall be taken during cold weather to prevent damage by freezing of any parts of the boiler containing water. The temperature in the machinery space shall be kept above 40°F.

V BOILER WATER AND FEEDWATER CHEMISTRY

A. The boilers shall be operated with feedwater and boiler water chemistry within the following requirements:

Boiler Water:

Constituent or Property	Requirement
Alkalalinity	9.8 to 10.2 pH
Phosphate	15 to 25 ppm
Chlorides	Less than 10 ppm
Total Dissolved Solids	Less than 100 ppm

Feedwater and Makeup Water

Constituent or Property	Requirement
Alkalalinity	8.8 to 9.2
Chlorides	Less than 0.6 ppm
Oxygen	Less than .02 ppm
Total Dissolved Solids	Less than 10 ppm
Conductivity	Less than 20 micromhos/cm

NOTE: (1) Water used for hydrostatic testing shall be in accordance with the feedwater requirements above.

(2) Boiler water shall be circulated if chemicals are added during wet lay-up.

B. Boiler water chemistry shall be controlled by the addition of CHEMICALS (sodium hydroxide and disodium phosphate) and by blowdown. The careless application of water treatment chemicals or blowdown will result in unsatisfactory protection. Ⓑ

1. Chemical Addition
   Chemical addition is utilized to maintain the pH and phosphate within the required limits which controls corrosion by converting scale-forming constituents into suspended solids. Specifically, the pH is controlled by the addition of SODIUM HYDROXIDE, and phosphate is controlled by the addition of disodium phosphate. The chemicals for water treatment are to be prepared by the Materials Engineering Department. Ⓑ
2. Boiler water blowdown is performed as a correction action when the specified limits for chlorides and total dissolved solids are exceeded. Boiler water can be blown down from either a surface or bottom blowdown system furnished on the boiler. Surface blowdown should be utilized if excessive carryover is noted, to remove some of the dissolved and suspended solids, and to maintain the boiler water chemistry limits while steaming. The boilers shall be given a surface blow daily even if the test results are within specification. Insufficient surface blows can cause foaming, followed by priming, and will cause the superheater to be subject to carryover.
   Bottom blowdown is generally utilized to reduce total dissolved solids, maintain chloride limits, and whenever the water is discolored or dirty. Only bottom blowdown will remove insoluble matter, which settles to the bottom of the boiler as sludge. A bottom blow should be applied each time the boiler is secured.
   NOTE; For specific instructions for blowing down, see the applicable section in the Boiler Technical Manual, reference (1).

C. The materials Engineering Department shall maintain boiler water treatment records showing: the type of treatment used, chloride, alkalinity of pH and hardness of phosphate results before and within one hour after treatment of boiler blows. In addition, the amount and type of chemical added, steaming hours and dates of boilers blows shall be recorded. (Refer to paragraph D for frequency of sampling.)

6800-62

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Analysis	Frequency	Specification	Method	Corrective Action
III. Boiler Water, Cold Wet Layup* (Short and Long Term)				
pH	Weekly	9.8 to 10.2	Same as above	Same as above
Phosphate	Weekly	15 to 25 ppm	Same as above	Same as above
Chlorides	Weekly	Less than 10 ppm	Same as above	Same as above
Total dissolved Solids	Weekly	Less than 100 ppm	Same as above	Same as above

*If chemicals are added during wet layup, the boiler water must be circulated.

Analysis	Frequency	Specification	Method	Corrective Action
IV. Feedwater and Makeup Water				
Chlorides	Once each watch	Less than 0.6 ppm	Same as above	(1) Determine and eliminate source
Conductivity	Once each watch	Less than 20 micromhos/cm	Conductivity meter	(1) Determine and eliminate source
pH	Once each watch	8.8 to 9.2	Same as above	(1) Determine and eliminate source
Total dissolved Solids	Once each watch	Less than 10 ppm	Same as above	(1) Determine and eliminate source

HULL NO. 613, 614, 615 DWG. NO. 6800-62
SHEET 11 OF 11
WN 47 8½ X 14

D. SUMMARY OF BOILER WATER AND FEEDWATER CHEMISTRY PROGRAM

Analysis	Frequency	Specification	Method	Corrective Action
I. Boiler Water, Hot Steaming Operation				
pH	Daily and after any water treatment	9.8 to 11.2	pH Meter	(1) Blowdown if too high (2) Chemical addition if too low
Phosphate	Daily and after any water treatment	15 to 25 ppm	Comparator	(1) Blowdown if too high (2) Chemical addition if too low
Chlorides	Daily and after any water treatment	Less than 10 ppm	Titration	High Chloride Concentration (1) Reduce power to minimum practicable (2) Blowdown (3) Locate and isolate source of chloride
Total dissolved Solids	Daily and after any water treatment	Less than 100 ppm	Conductivity	(1) Blowdown
II. Boiler Water, Not Nonsteaming (Standby)				
pH	Every 3 days	Same as above	Same as above	Same as above
Phosphate	Every 3 days	Same as above	Same as above	Same as above
Chlorides	Every 3 days	Same as above	Same as above	Same as above
Total dissolved Solids	Every 3 days	Same as above	Same as above	Same as above

HULL NO. 613, 614, 615 DWG. NO. 6800-62
SHEET 10 OF 11
WN 47 8½ X 14

6800-62

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FRAME
8X

6960-103 A

CSD VAULT

REVISIONS

REV.	SHEET	DESCRIPTION	NNS & DD Co. DATE	NNS & DD Co. AUTH'D.	OWNER DATE	OWNER APP'D.
—	—	SEE SHT 2	—	—	—	—

REV. STATUS OF SHEETS

REV.	C	C	A	C	C	C	B
SHEET	1	2	3	4	5	6	7

GROUP

MC NO.

DWG. REV. — HULL APPLIC.

REV.	NN HULLS ONLY 613C	614C	615C
A	YES	YES	YES
B	YES	YES	YES
C	YES	YES	YES

NNS & DD Co. HULL NO.	MARAD HULL NO.	USMA DESIGN	SHIP'S NAME
615C	311		
614C	310		
613C	309	T11-S-116a	

APPROVALS

OWNERS

ABS NR

USCG NR

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

FSCM NO. 43689

COMMERCIAL DESIGN DIVISION DEPT. E13

Group - 6440-2301-1001-SI

GROUP SHTS SEE DWG 6960-140

SCALE: NONE = 1 Ft.
DRAWN: G.L. BROWN
CHECKED: J.H.J
SECT. MGR. J H Johnson

DATE COMPL. 6-30-77
EXAMINED: —
AUTHORIZED: A. Conley /RLH
DATE 6-30-77

TECH. APPROVAL NR

CSD APPROVAL R. L. Harrington

TITLE LABEL PLATES FOR MAIN STEAM SYS ENGINE ROOM

DWG. NO. 6960-103

REVISION C

SHEET NO. 1 OF 7

M7 11 X 17

407 5 6-28

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS
DATE 4-6-78 SIGNED J H Johnson

SPECIAL PRINTS

REV.	DATE ISSUED
A	7-14-77
B	2-9-78
C	4-19-78

YARD PRINTS

FIRST ISSUE	DEPT.	NO. PRINTS
	AH	
	BL	
	BR	
	EL	
	FP	
7-14-77	MI	6
	ML	
	MS	
	PC	
	PM	
	PS	
	PN	
	RD	
	RM	
	MIR	
	SH	
	SM	
	TM	
	WD	
	WE	
	WM	
	X16	
7-14-77	Ro	1

ORDERED BY DESIGN

FIRST ISSUE	DEPT.	NO. PRINTS
7-14-77	SEPIA/RO	1
	CSD-V	1
	KSD	1
2-9-78	MAIL	15

GROUPED CHK.	BY	DATES COMP.	PART

HULL 613C

KEY GROUP NO.

TYPE OF DWG. —

6960-103

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SEPT. '80

4X

REVISIONS

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		OWNERS	
N N	OWNER					DATE	AUTHD	DATE	APPD
—	—	A	all	all	INITIAL ISSUE	6/30/7		—	-
		B			ADDED GROUPS	1/23/18	*		
		C	4 5 6	7 7,9 1	ALT'D INSCRIPTION THE ABOVE CHANGES TO SUIT OWNER'S COMMENTS GER	4/6/18	*		

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		USN	
N N	NAVSHIPS					DATE	AUTHD	DATE	APPD

LABEL PLATES FOR MN STM SYS ENG RM	HULL NO.	DWG. NO.	REV. C
	613c, 614c, 615c	6960-103	SHEET 2

K&E 19 1253 10-71 2236•

NN11-11 X 17 (REV. 1)

6960-103

MICRO-MASTER® 105 mm

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4X

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NO.	TITLE		DWG NO.
1	LABEL PLATE STANDARDS		213338

LABEL PLATES FOR MAIN STEAN SYS ENG RM	HULL NO. 613c, 614c, 615c	DWG. NO. 6960-103	REV. A
			SHEET 3

K&E 19 1253 10-71 2236•

NN12-11 X 17 (REV. 1)

6960-103

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		DET REF. NO. 1																			
		MISC					VALVES														
PRINTS	NO. PC.	MATL & THK	WIDTH	LETTERS TYPE	LETTERS SIZE	SH. NO.	ITEM NO.	MATL & THK	INSCRIPTION	MATL. SOURCE	REMARKS	REF 1 ATTACH CLASS DWG NO. SHEET	ARR DWG NO.	ITEM OR ASSY TO BE LABELED	DECK	FR	CL OR DIM P OR S	COMPT	MATERIAL RECORD	LINE NO.	REV
	1	SEN AL .02	5/8	R	1/8	17	—	—	V-1 MN STM - STBD BLR SUPHTR OUTLET	S		W 8	6440-507	V-1				ENGINE ROOM		1	
	1	↓	↓			↓	—	—	V-2 MN STM-PORT BLR SUPHTR OUTLET			↓		V-2						2	
	1	—	—			28	15	SEN AL .032	V-3 MN STM - STBD BLR SUPHTR OUTLET			H 8		V-3						3	
	1	—	—						V-4 MN STM - PORT BLR SUPHTR OUTLET					V-4						4	
	1	—	—			↓	↓	↓	V-5 MAIN STEAM TO MAIN TURB			↓		V-5						5	
	1	SEN AL .02	5/8			17	-	-	V-6 MAIN STEAM TO MAIN TURB			W 8		V-6						6	
	1	↓	↓			↓	—	—	V-7 ASTERN GUARDIAN VALVE			↓		V-7						7	C
																				8	
	1	—	—			28	20	SEN AL .032	V-9 MAIN STEAM TO TG ROOT		1"I.D. X 2½"O.D.	H 8		V-9						9	
	1	SEN AL .02	5/8			17	-	-	V-10 MAIN STEAM TO TG CUTOUT			W 8		V-10						10	
	1	—	—			28	9	SEN AL .032	V-11 MN STM FLOW TRANSMITTER CUTOUT			H 8		V-11						11	
	1	—	—				↓		V-12 ↓					V-12						12	
	1	—	—				15		V-13 MN STM TO CARGO & BALL PMP TURBS					V-13						13	
	1	—	—						V-14 MN STM TO BALL PUMP TURB CUTOUT					V-14						14	
	1	—	—						V-15 MN STM TO CARGO PMP NO.1 TURB CUTOUT					V-15						15	
	1	—	—						V-16 MN STM TO CARGO PMP NO.2 TURB CUTOUT					V-16						16	
	1	—	—						V-17 MN STM TO CARGO PMP NO. 3 TURB CUTOUT					V-17						17	
	1	—	—	↓	↓	↓	↓	↓	V-18 MN STM TO CARGO PMP NO. 4 TURB CUTOUT	↓		↓	↓	V-18				↓		18	

ROUTING	CONTROL NO. SHOP	CONTROL NO. ERECTION	GROUP NO.	LABEL PLATE LIST	DRAWN / CHK	DATE / APPD	N N DRAWING NO.	HULL NO.	SHEET NO.	REV
			6440-2301-1001-SI	FOR MAIN STEAM SYS ENGINE ROOM			6960-103	613C 614C 615C	4	C

K&E 19 1253 2-72 2293•

MN22B (REV. 1) (11X17)

6960-103

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		DET REF. NO. /																			
		MISC					VALVES														
				LETTERS																	
PRINTS	NO. PC.	MATL & THK	WIDTH	TYPE	SIZE	SH. NO.	ITEM NO.	MATL & THK	INSCRIPTION	MATL. SOURCE	REMARKS	REF / ATTACH CLASS DWG NO. SHEET	ARR DWG NO.	ITEM OR ASSY TO BE LABELED	DECK	FR	CL OR DIM P OR S	COMPT	MATERIAL RECORD	LINE NO.	REV
	/	SEN AL .02	5/8	R	1/8	17	—	—	V-19 MN STM STBD BLR SUPHTR SAFETY VLV	S		W 8	6440-507	V-19				ENGINE ROOM		1	
	/						—	—	V-20 MN STM PORT BLR SUPHTR SAFETY VLV					V-20						2	
	/						—	—	V-21 MN STM STBD BLR CONT DESUPHTR CONT VLV					V-21						3	
	/	↓	↓			↓	—	—	V-22 MN STM PORT BLR CONT DESUPHTR CONT VLV			↓		V-22						4	
	/	—	—			28	9	SEN AL .032	V-23 MN STM FLOW TRANSMITTER CUTOUT			H 8		V-23						5	
	/	—	—				↓		V-24 ↓					V-24						6	
	/	—	—				10		V-25 MN STM TO STBD BLR STM PRESS XMTR					V-25						7	C
	/	—	—						V-26 ↓					V-26						8	
	/	—	-						V-27 MN STM TO PORT BLR STM PRESS XMTR					V-27						9	C
	/	—	—			↓	↓	↓	V-28 ↓			↓		V-28						10	
	/	SEN AL .02	5/8			17	—	—	V-29 MN STM STBD BLR DRUM PILOT SAFETY VLV			W 8		V-29						11	
	/						—	—	V-30 ↓					V-30						12	
	/						—	—	V-31 MN STM PORT BLR DRUM PILOT SAFETY VLV					V-31						13	
	/	↓	↓			↓	—	—	V-32 ↓			↓		V-32						14	
	/	—	—			28	10	SEN AL .032	V-33 MN STM PRESS XMTR CUTOUT			H 8		V-33						15	
	/	—	-				↓		V-34 ↓					V-34						16	
	/	-	—				9		V-35 STBD BLR SAT ST OUT VENT TO ESCAPE					V-35						17	
	/	-	-	↓	↓	↓	↓	↓	V-36 ↓	↓		↓	↓	V-36				↓		18	

ROUTING	CONTROL NO. SHOP ERECTION	GROUP NO. 6440-2301-1001-SI	LABEL PLATE LIST FOR MAIN STEAM SYS ENGINE ROOM	DRAWN GLB CHK	DATE APPD·	N N DRAWING NO. 6960-103	HULL NO. 613C 614C 615C	SHEET NO. 5	REV C

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MN22B (REV. 1) (11X17)

6960-103

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1 PRINTS	2 NO. PC.	3 DET REF. NO. / MISC MATL & THK	4 WIDTH	5 LETTERS TYPE	6 LETTERS SIZE	7 SH. NO.	8 VALVES ITEM NO.	9 VALVES MATL & THK	10 INSCRIPTION	11 MATL. SOURCE	12 REMARKS	13 REF 1 ATTACH CLASS DWG NO. SHEET	14 ARR DWG NO.	15 ITEM OR ASSY TO BE LABELED	16 DECK	17 FR	18 CL OR DIM P OR S	19 COMPT	20 MATERIAL RECORD	21 LINE NO.	22 REV
	1	—	—	R	1/8	28	9	SEN AL .032	V-37 PORT BLR SAT STM OUT VENT TO ESCAPE	S		H 8	6440-507	V-37				ENGINE ROOM		1	C
	1	—	—						V-38					V-38						2	
	1	—	—						V-39 PRESS SWITCH CUTOUT		FOR 613C, 614C ONLY			V-39						3	
	1	—	—						V-40					V-40						4	
	1	—	—						V-41 MN STM START UP CIRC TO ESCAPE STBD BLR					V-41						5	
	1	—	—						V-42					V-42						6	
	1	—	—						V-43 MN STM START UP CIRC TO ESCAPE PORT BLR					V-43						7	
	1	—	—						V-44					V-44						8	
	1	SEN AL .02	5/8			17	—	—	V-45 MN STM STBD BLR SPHTR SAFETY			W 8		V-45						9	
	1						—	—	V-46 PORT					V-46						10	
	1	—	—			28	15	SEN AL .032	V-47 MN STM STBD BLR SPHTR SAFETY CUTOUT			H 8		V-47						11	
	1	—	—						V-48					V-48						12	
	1	—	—						V-49 MN STM PORT BLR SPHTR SAFETY CUTOUT					V-49						13	
	1	—	—						V-50					V-50						14	
	1	—	—				9		V-51 MN STM FLOW XMTR CUTOUT					V-51						15	
	1	—	—						V-52					V-52						16	
	1	—	—						V-53					V-53						17	
	1	—	—						V-54					V-54						18	

ROUTING	CONTROL NO. SHOP ERECTION	GROUP NO. 6440-2301-1001-SI	LABEL PLATE LIST FOR MAIN STEAM SYS ENGINE ROOM	DRAWN GLB CHK	DATE APPD	N N DRAWING NO. 6960-103	HULL NO. 613C 614C 615C	SHEET NO. 6	REV C

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6960-103

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		DET REF. NO. /																			
		MISC					VALVES														
				LETTERS																	
PRINTS	NO. PC.	MATL & THK	WIDTH	TYPE	SIZE	SH. NO.	ITEM NO.	MATL & THK	INSCRIPTION	MATL. SOURCE	REMARKS	REF 1 ATTACH CLASS DWG NO. SHEET	ARR DWG NO.	ITEM OR ASSY TO BE LABELED	DECK	FR	CL OR DIM P OR S	COMPT	MATERIAL RECORD	LINE NO.	REV
	1	SEN AL .02	5/8	R	1/8	17	–	–	V-55 PORT BLR DRUM SAFETY VLV	S		W 8	6440-507	V-55				ENGINE ROOM		1	
	1	↓	↓			↓	–	–	V-56 STBD ↓ ↓ ↓ ↓					V-56						2	
	1	–	–			28	9	SEN AL .032	V-57 V45 CONT SWITCH CUTOUT					V-57						3	
	1	–	–						V-58 LINE DR					V-58						4	
	1	–	–						V-59 ↓ ↓ ↓					V-59						5	
	1	–	–						V-60 V46 CUTOUT					V-60						6	
	1	–	–						V-61 LINE DR					V-61						7	
	1	–	–	↓	↓	↓	↓	↓	V-62 ↓ ↓ ↓ ↓ ↓	↓		↓	↓	V-62				↓		8	

ROUTING	CONTROL NO. SHOP	ERECTION	GROUP NO.		DRAWN / CHK	DATE / APPD.	N N DRAWING NO.	HULL NO.	SHEET NO.	REV
			6440-2301-1001-SI	LABEL PLATE LIST FOR MAIN STEAM SYS ENGINE ROOM	GLB		6960-103	613C 614C 615C	7	A

K&E 19 1253 11-74 W2974•

MN22B (REV. 1) (11X17)

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4X

HF-35

REPRODUCTION OFFICE

YARD PRINTS YES GROUPING YES

REMARKS

Reslow Cop, 1 Groups + issue

DATE 3/15/79 SIGNED R W SILLING JR

	FIRST ISSUE	DEPT.	NO. PRTS.	REV.	DATE ISSUED	SPECIAL PRINTS
YARD PRINTS		AH		A	1-7-77	
		BL		B	4-20-77	
		BR		C	11-11-77	
	9-12-78	EL	2	D/E	3-31-78	
		FP		F	7-12-78	
		MI		G	3-28-79	
		ML				
		MS				
	1-7-77	PC	1			
		PM				
		PS				
		PN				
		RD				
		RM				
		OA	2			
	1-7-77	OB	2			
		OGIA	1			
		TM				
		WD				
		WE				
		WM				
		CSD				
	11-11-77	PT	3			
ORDERED BY DESIGN	1-7-77	CSDIV	1			
		KSDBL	1			
		RWS	1			
		KG/SEPIA	1			

GROUP: MC NO. 160

Grouped For Hull 614 613 Date 12-16-6
By SDW Sect. Mgr. WAR

7000-104 MFG-SHEATHING FOR OUTSIDE MN DK HSE
7000-1400-1001 INSTALL-SHEATHING OUTSIDE OF DK HSE
7000-1601-1001 INSTALL BHD AFT DK HSE
7000-1701-1001 INSTALL BHD FWD DK HSE
7000-0405-1001 INSTALL BHD BOSN STRM AFT OF BHD 23 PORT
7000-2301-1001 INSTALL BHD IN ER, EOS, ELEV TRK-ESCAPE TRK

K&E 19 1253 3-72 2348•

GENERAL NOTES

1 WHERE NECESSARY INSUL IS TO BE HELD IN PLACE BY WIRE LACING FROM STUDS.

2 DZUS FASTENERS PT 27 ARE TO BE TYPE AJW5-35 RETAINED BY GAS-375 HALF GROMMET WITH S5-200 SPRING.

3 HINGED PANELS WITH QUICK ACTING CATCHES SHALL BE PROVIDED WHERE FREQUENT ACCESS IS NECESSARY AND CLEARLY LABELED AS TO THE CONCEALED EQUIPT. MATL TO BE PROCURRED AS NEEDED.

4 WELDING TO BE IN ACCORDANCE WITH APPLICABLE NOTES ON REF 1 & 2.

5 ALL PAINTING TO BE IN ACCORDANCE WITH APPLICABLE NOTES ON REF 3.

6 ◯ DENOTES SYMBOLS LISTED IN TABLE ON SH 4 , ◯ DENOTES PARTS IN LIST OF MATERIAL.

7 ALL INSULATION SHALL BE IN DIRECT CONTACT WITH SURFACE TO ELIMINATE VOIDS BETWEEN STRUCTURE & THE INSULATION.

8 THE INSULATION MATERIAL SHALL NOT BE PACKED IN & THE THICKNESS OF THE INSTALLED INSULATION SHALL BE THE SAME AS THAT OF THE ORIGINAL BATTS.

Ⓓ 9 THE FOLLOWING PARTS ARE U.S.C.G. APPROVED INCOMBUSTIBLE MATERIALS & ARE LISTED IN U.S.C.G. EQUIP LIST CG-190 UNDER THE FOLLOWING APPROVAL NUMBERS:

PART NO	APPROVAL NO	VENDOR
1	164.009/136/1	OWENS CORNING TIW-TY II
2	164.009/136/1	OWENS CORNING TIW-TY II
15	164.012/11/1	FOSTER NO 31-31

13,14,30&35 AUTOMATICALLY MEET REQT (SEE CG190 SUBPART 164.009).

10 THE FOLLOWING PARTS ARE U.S.C.G. APPROVED STRUCTURAL INSULATION AND ARE LISTED IN U.S.C.G. EQUIP LIST CG-190 UNDER THE FOLLOWING APPROVAL NUMBERS:

PART NO	APPROVAL NO	VENDOR
5	164.007/40/0	UNITED STATES GYPSUM CO
6	164.007/40/0	UNITED STATES GYPSUM CO

11 SHEATHING MAY BE RECESSED IN WAY OF PIPING OR EQUIPMENT SIMILAR TO DETAIL 8B.

12 SYMBOL ① INSULATION IN MACHINERY SPACES TO BE COATED IN ACCORDANCE WITH SHEET 9, NOTE D-9 ON REF 3.

ISSUE	
PARTIAL	✓
COMPLETE	

13. SHEATHING RETAINER, PT 32 IN L/M, IS PROVIDED FOR USE, AS NECESSARY, IN AREAS WHERE DRILLING WOULD BE DIFFICULT OR IMPOSSIBLE DURING INSTALLATION OF SHEATHING.

14. SHEET METAL SHEATHING TO BE LAP JOINTED AND SEALED WITH FOSTER NO 31-31 ADHESIVE, PART 15 IN L/M.

15. PT 35 SHALL BE INSTALLED BETW INSUL & PERFORATED CEILING PANELS TO PREVENT FIBER GLASS DUST FROM SIFTING THROUGH PERFORATIONS IN SHEATHING.

CONTINUED ON SHEET 1-A

SHEET												
REVISION												
SHEET												
REVISION												
SHEET	1	2	3	4	5	6	7	8	9	10	11	1-A
REVISION	G	G	G	C	G	C	F	D	E	E	C	D

AUTHORITY

DWG. REV. — HULL APPLIC.						
REV.	NN HULLS ONLY					
	613	614				
A	YES	YES				
B	YES	YES				
C	YES	YES				
D	YES	YES				
E	YES	YES				
F	YES	YES				
G	YES	YES				

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
614C	310	
613C	309	

APPROVALS

OWNERS LTR 1418V DATED 2-7-77	ABS
USPH LTR (A/C 202 245-1505) DATED 11-26-76	USCG LTR 16710/NNS & DD HULLS 613-615 DATED 12-10-76

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

HULL DESIGN DIV.

FSCM NO. 43689
FITTINGS DEPT.

SCALE AS NOTED = 1 FT
DRAWN L STOKES
CHECKED BOB FOWLER
SECT MGR R W Sillings

DATE COMPL 9-10-76
EXAMINED F. F. Taylor
AUTHORIZED E. E. Stephenson
DATE 9-13-76

TECH APPROVAL NOT REQUIRED

CSD APPROVAL R. L. Hanington

390,000 DWT TANKER
INSULATION & SHEATHING
OUTSIDE DK HOUSE-ARR & DETAILS

USMA DESIGN T11-S-1162
USMA DWG NO.
HULL NO. 309, 310

DWG NO. 7000-104
REV G
SHEET NO. 1 OF 11

1008

MN15-17X22 (REV. 1)

MODIFIED

7000-104

MICRO-MASTER 105 mm K+E

SEPT. '80

6X

GENERAL NOTES (CONT'D)

Ⓓ 16. ~~FASTENER TO BE U.S.M. CORP. PARKER-KALON FASTENER DIVISION SELF DRILLING-TAPPING SCREW, PHILLIPS PAN HEAD, ZINC PLATED "DRIL-KWICK" #2", 10-16 x ½ LG OR EQUAL.~~

Ⓓ 17. FASTENER TO BE BUILDEX (DIVISION OF ILL. TOOL WORKS INC.) "TEKS" TYPE.

HULL NO. 613c, 614c	DWG NO. 7000-104	REV. D	
		SHEET 1-A	

K&E 19 1253 7-74 W 2847 B+

MN15-17X22 (REV. 1)

7000-104

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6X

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6	ARRGT - 78'-4 FLAT & DETAILS
7	ARRGT - 60'-0 & 33'-0 MACHY FLAT
8	ARRGT - HOLD & DETAILS
9	DETAILS
10	DETAILS
11	DETAILS
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NO.	REFERENCES	DWG. NO.
1	GENERAL NOTES PERTAINING TO HULL STRUCT	0100-749
2	MERCHANT SHIP WELDING	HM0100-579
3	PAINTING SCHEDULE	8300-40
4	FIRE CONTROL PLAN	0100-777

REVISIONS

COST CHG NO. NN	COST CHG NO. OWNER	REV	SH NO	DESCRIPTION	NNS&DDCO DATE	NNS&DDCO AUTHD	OWNER DATE	OWNER APPD
—	–	E	5	IN DET 5-B - IN CO_2 RM, FR 38(P) INSUL TYPE 3 ADDED IWO OVERHD				
			3	IN L/M - PT 5 & 19 INCR TO 10,342 & 17,145 SQ FT RESPECTIVELY. ALL TO SUIT PLAN CORRECTION				
—	—		9 10	IN DET 9-C & 10-B - SCREW SPACING ON INTERIOR SHEATHING CHNG TO 5 FROM 8. ALL TO SUIT OWNERS REQUEST, LTR TRANS NO. 1885 V, DATED 2-2-78	HLB	RWS 2/27/78	D.D.	
—	—	F	5 7	IN DET 5-A - INSUL REV IWO ACS TR FR 58 (S). IN DET 7-B - INSUL ADDED IWO ESC TR BET TOP OF OPR STA & 78'-4 FLAT. DET 7-C ADDED.				
			4	IN L/M - PT 5 INCR FROM 10342 SQ FT TO 10515 6 — 6502 SQ FT TO 6560 10 — 7355 TO 7455 12 — 37084 TO 37184 19 — 17145 SQ FT TO 17270 ALL TO SUIT C&A REF 4	HLB	RWS 8/15/78	D.D.	
		G	2, 3, 5	IN DET. 5-A - REV INSUL IWO BHD FR 58 & ACS TRK (S). DET. 5-E ADDED. IN L/M PT 4 INCR FROM 11250 SF TO 11310 SF, PT 5 FROM 10515 SF TO 10575 SF, PT 12 FROM 37184 TO 37244, & PT 37 ADDED. ACCOMPLISHED ON 613C BY LIAISION RWS-6. ALL TO FACILITATE YARD INSTALLATION.	JLC HLB	RWS 3/15/79	D.D.	

3/23/78

8-25-78

MGR 3-22-79

REVISIONS

COST CHG NO. NN	COST CHG NO. NAVSHIPS	REV	SH NO.	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
A				INITIAL ISSUE	☒	☒	☒	☒
B				1. DETS 8-B, 8-C, 8-D, 9-B, 9-C, 9-D, 9-E, 10-B & 10-E REVISED TO INDICATE SEAM SEALING COMPOUND, PT 15, IN JOINTS OF SHEATHING. QTY FOR PT 15 IN L/M SH 3 REVISED FROM 292 GAL TO 342 GAL TO SUIT. ALL TO SUIT OWNERS LETTER 1418 V DATED 2-7-77.				
				2. NOTE ADDED TO DET 5-B, 5-C, 6-A, 7-A, 7-B & 8-A REFERING TO ADDED GEN NOTE 12. ALL TO SUIT U.S.C.G. APPROVAL LETTER 16710/NNS&DD HULLS 613-615 SER 3586 DATED DEC. 10, 1976.				
				3. IN DET 5-B INSULATION SYM 3 RELOCATED FROM FWD BHD IN BOOBY HATCH TO AFT BHD IN UPTAKE IN WAY OF BOOBY HATCH TO SUIT C.S.D. REQUEST DATED 2-7-77.				
				4. SYM 3 INDICATED ON SIDES OF ACCESS THRU BHD 23 ON STBD SIDE IN DET 6-A. ALL TO SUIT ADDED REF 4.				
				5. IN DET 10-E WELD REVISED FROM DOUBLE TO SINGLE FILLET. IN L/M SIZE FOR PT 3 REV FROM 36X48 TO 24X36 TO SUIT AVAILABLE SIZES. DET 11-B ADDED TO PROVIDE STUD SP.	LSS	AAS 3-25-77		
C				1. IN DET 7-B, TYPE OF INSUL REV. FROM NC 3AP ACOUSTIC BOARD TO METAL SHEATHED BLANKET INSULATION. IN DET 9-C, REF MADE TO BOUNDRY BAR, PERFORATED SHEATHING AND WELDING OF F.B. TO BHDS AND DK HEADS INDICATED. IN DET 8-B, REF MADE TO FIBRE-GLASS CLOTH BEHIND PERFORATED SHEATING ON CEILING. ON SHEET 1, NOTE 15 ADDED. ON SHEET 3, PT 3 DELETED, PT 1 INCREASED FROM 11259 TO 11959, PT 2 FROM 3160 TO 6956, PT 7 FROM 12387 TO 13387, PT 10 FROM 7155 TO 7355, PT 12 FROM 34084 TO 37084, PT 13 FROM 42591 TO 43591, PT 15 FROM 342 TO 343, PT 20 FROM 12478 TO 12603, PT 21 FROM 2073 TO 2223, PT 23 FROM 94352 TO 97852, PT 24 FROM 628 TO 688, PT 29 FROM 16902 TO 19302 AND PTS 34 AND 35 ADDED. DECREASED PT 4 FROM 11985 TO 11285, PT 16 FROM 20281 TO 18281, PT 17 FROM 33467 TO 30467, AND PT 18 FROM 13186 TO 12186. PT 23 INCREASED FROM 94352 TO 97852 AND MOD FROM #10 RD HD SELF-TAPPING SCREW, STL CAD PL, L=½ TO #10 SELF DRILLING-TAPPING SCREW, STL ZINC PL, L=½ SEE NOTE 16. ON SHEET 4 ASSY 5 VOIDED AND ASSY 6 ADDED. ALL TO SUIT COAST GUARD LTR 16710/NNS&DD HULLS 613-615 SER 4091 DATED AUG 5, 1977.				
				2. ON SHEET 1, NOTES 13 AND 14 ADDED. ADDED SHEET 1-A AND NOTE 16. ON SHEET 3, PTS 32 AND 33 ADDED. IN DETS 6-B AND 8-B 1 REVISED TO ½ ABT. DETS 6-B, 8-B, 8-C, 8-D, 9-B, 9-D, 10-B, 10-E, 10-F AND 11-A REVISED TO SUIT. DET 11-C ADDED TO SHT 11. ALL TO SUIT DEVELOPMENT AND YARD REQUESTS.	AH	RWS 9/29/77	D.D.	
D			1-A	IN GEN NOTES DELETED NOTE 16 & ADDED NOTE 17				
			3	IN L/M. REVISED PT 23 & ADDED PT 36.				
			8 9 10	IN DET 8-B, 8-C, 8-D, 9-B, 9-C, 9-D, 9-E & 10-E INTERIOR SHEATHING SCREWS PT 23 & ADDED PT 36, RESPACED FROM 3 CTRS TO 4 FOR 20 GA SHEATHING & 6 CTRS FOR 16 GA SHEATHING. IN DET 10-B RESPACED FROM 3 CTRS TO 8 CTRS. IN DET. 10-A BHD ADDED. IN DET 10-D DIMENSIONS CHANGED THRU-OUT. IN DET 9-C FURRING STRIP SPACING ALT FROM 23 X 23 TO ABT 23½ X ABT 47½ & ADDED NOTE "ADDITIONAL MEMBERS TO BE USED WHEN REQ'D TO CLEAR PIPING & OTHER FOULS.				
				ALL TO SUIT DESIGN DEVELOPMENT & YARD REQUEST.	JES HLB	RWS 1/23/78	D.D.	

WAR 4-14-7

10-25-77

HULL NO. 613C, 614C	DWG. NO. 7000-104	REV. G
		SHEET 2

NN14-17 X 22 (REV. 1)

7000-104

MICRO-MASTER 105 mm

K+E

SEPT. '80

6X

LIST OF MATERIAL

QUANTITIES ARE FOR ONE SHIP

NO PARTS REQ'D		PART NO	NAME OF PART	MATERIAL	MAT'L SPECS	ZONE	REMARKS
11959 SF		1	1 INSUL 2LB DENSITY	FBRS GLASS	32-MA-3C, CL5	GEN	36 WIDTH - SEE NOTE 9
6956SF		2	2 INSUL 2LB DENSITY	↓	↓	↓	↓ ↓
~~1896 SF~~		3	~~2 FCD BOARD INSUL AC~~	↓	COML	↓	~~24X36 NC3AP BOARD-OWENS CORNING OR EQ~~
Ⓖ 11310 SF		4	1 FCD BOARD INSUL 2.75#D	↓	↓	↓	36X48 NC3A BOARD-OWENS CORNING OR EQ
Ⓖ Ⓕ Ⓔ 10575SF.		5	3 INSUL 7LB DENSITY	↓	32-MA-1E	↓	36X48 - SEE NOTE 10
Ⓕ 6560 SF		6	1 1/2 INSUL 7LB DENSITY	↓	↓	↓	↓ ↓
13387		7	INSUL STUD L=1 1/2 AW	STL	COML	9A	KSM CAT 560 PG 37 OR EQ 1/8 DIA
882		8	INSUL STUD L=2 1/2 AW	↓	↓	↓	↓
13660		9	INSUL STUD L=3 1/2 AW	↓	↓	↓	↓
Ⓕ 7455		10	INSUL STUD L= 2 AW	↓	↓	↓	↓
3811SF		11	20 GA SHEATHING	STL GALV	COML	9C	48X96 SHEETS
Ⓖ Ⓕ 37244		12	SPEED CLIP	STL ZINC PL	COML	9A	2 1/2 SQUARE FOR 1/8 DIA STUD KSM CAT 560 PG 32 OR EQ
43591 LF		13	2 WIDE TAPE	FBRS GLASS	↓	10F	OWENS CORNING OR EQ (UNTREATED) NOTE 9
1201 LF		14	3 WIDE TAPE	↓	↓	10F	↓ ↓
343GAL		15	ADHESIVE	COML	↓	10F	FOSTER NO 31-31 - SEE NOTE 9
18281		16	3/16 DIA ANNULAR GROOVE STUD	STL	↓	10F	L=1 7/8 AW .015 DIA TIPPED WELDED END KSM OR EQ
30467		17	DRIVE CAP	ALUM	↓	10F	HUCK MFG CO R2418T-A6-8
12186		18	3/16 DIA ANNULAR GROOVE STUD	STL	↓	11A	L= 7/8 AW .015 DIA TIPPED WELDED END KSM OR EQ
Ⓕ Ⓔ 17,270 SF		19	16 GA SHEATHING	STL GALV	↓	9C	48 X 96 SHEETS
12603		20	SUB FRAME SUPPORT	STL	ABS HULL	10A	3/4 X 7/8 X 1/8 FB
2223LF		21	DK BOUNDARY	STL	ABS HULL	9C	1 1/2 X 1/8 FB X 1/8 FB
485 LF		22	END PLATE	STL GALV	COML	9D	14GA 1 FLG L=TO SUIT
Ⓓ 97852		23	#10-16 SELF DRILLING-TAPPING SCREW	STL ZINC PL	↓	9C	L=5/8 SEE NOTE 17
828 LF		24	CORNER SUB FRAME	STL GALV	↓	9C	1 1/2 X 1 1/2 X 14GA ∠
435 LF		25	DK BOUNDARY BAR	STL	ABS HULL	10E	3 X 1/8 FB
378 LF		26	END PLATE	STL GALV	COML	8D	1 X 1 X 14GA ∠
AS REQ'D		27	DZUS FASTENERS	COML	SEE NOTE 2	6C	SEE NOTE 3
AS REQ'D		28	1 1/2 X 1 1/2 HINGE	STL CAD PL	COML	6C	SEE NOTE 3
19302LF		29	SUB FRAME	STL GALV	COML	9C	1 1/2 X 1/8 ⊔ 14GA
1845LF		30	4 WIDE TAPE	FBRS GLASS	COML	10F	OWENS CORNING OR EQ (UNTREATED) NOTE 9
16540SF		31	2 FCD BOARD INSUL 2.75#D	FBRS GLASS	COML	GEN	36X48 NC3A BOARD-OWENS CORNING OR EQ
20		32	SHEATHING RETAINER STRIP - L=8'0 EACH	STL GALV	ABS HULL	11-C	16 GAGE, SEE DETAIL 11-C, SEE NOTE 13
40		33	BOUNDARY BAR, L=8'-0 EACH	STL GALV	ABS HULL	GEN	1 1/2 X 14 GAGE F.B.
2000SF		34	16 GAGE PERFORATED SHEATHING	STL GALV	COML	8-B	3/16 DIA HOLES ON 3/8 CENTERS STAGGERED
800SF		35	CLOTH	FIBERGLAS	COML	8-B	60 WIDE - J.P. STEVENS ST. 84205 FIN 9383
Ⓓ 2000		36	#12-24 SELF DRILLING-TAPPING SCREW	STL ZINC PL	COML	9-C	SEE NOTE 17 L=7/8
Ⓖ 60		37	INSUL STUD L=4 1/2 AW	STL	COML	5-E	KSM CAT 560 PG 37 OR EQ 1/8 DIA

HULL NO. 613C, 614C	DWG NO. 7000-104	REV. G
		SHEET 3

K&E 19 1253 7-74 W 2847 B •

MN15-17X22 (REV. 1)

7000-104

MICRO-MASTER 105 mm

K+E

ARLINGTON • WASHINGTON • BETHESDA
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SEPT. '80

6X

LIST OF SYMBOLS

SYM	DESCRIPTION	REMARKS
①	2 FACED THRM ON PL SURF W/1 FACED THRM ON W/F	DET 10F & 11A
②	2 THRM ON PL SURF W/1 THRM ON STIF SHEATHED	DET 8B
③	3 THRM ON PL SURF W/1½ THRM ON STIF SHEATHED	A-60 BHD INSUL DET 6B
④	1 THRM ON PL SURF W/1 THRM ON STIF SHEATHED	DET 8B
⑤	~~2 ACOUSTIC ON PL SURF W/1 FACED THRM ON STIF~~	~~DET 10F & 11A~~
⑥	2 THERM ON PL SURF W/1 THERM ON STIF SHEATHED WITH PERFORATED SHEATHING	

K&E 19 1253 7-74 W 2847 B •

HULL NO. 613C, 614C	DWG NO. 7000-104	REV. C	
		SHEET 4	

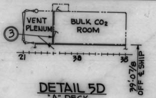
MN15-17X22 (REV. 1)

7000-104

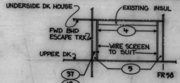
MICRO-MASTER® 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

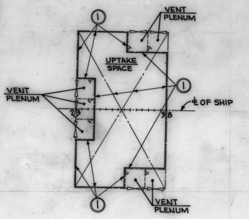
6X


VENT PLENUM
BULK CO2 ROOM
③
21
30
38
39'-07/8 OFF ℄ SHIP

DETAIL 5D
"A" DECK
1/16 = 12

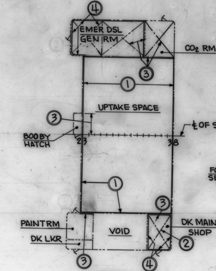

UNDERSIDE DK HOUSE
EXISTING INSUL
FWD BHD ESCAPE TRK
④
WIRE SCREEN TO SUIT
UPPER DK
⑤
37
12
FR 58

DETAIL 5-E
NO SCALE


①
VENT PLENUM
UPTAKE SPACE
VENT PLENUM
①
℄ OF SHIP
23
38
①
VENT PLENUM

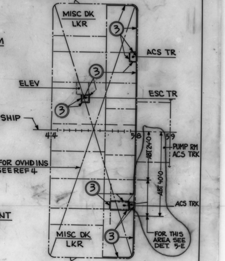
SEE NOTE 12

DETAIL 5C
123'-0 LEVEL
1/16 = 12


④
EMER DSL GEN RM
CO2 RM
③
①
UPTAKE SPACE
③
BOOBY HATCH
23
38
①
③
PAINT RM
VOID
DK MAINT SHOP
DK LKR
②
③
④

SEE NOTE 12

DETAIL 5 B Ⓔ
UPPER DECK
1/16 = 12


MISC DK LKR
③
ACS TR
ELEV
③
ESC TR
③
℄ OF SHIP
44
58
59
ABT 24'-0
PUMP RM ACS TRK
FOR OVHD INS SEE REF 4
ABT 40'-0
③
ACS TRK
MISC DK LKR
③
FOR THIS AREA SEE DET. 5-E

DETAIL 5 A Ⓕ Ⓖ
UPPER DECK TO 30 ABV AT ℄
1/16 = 12

HULL NO. 613C, 614C	DWG NO. 7000-104	REV. G		
		SHEET 5		

K&E 10 1253 7-74 W 2847 B •

MN15-17X22 (REV. 1)

7000-104

MICRO-MASTER 105 mm

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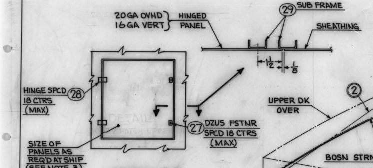
SEPT. '80

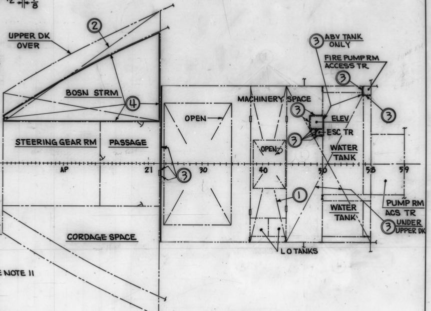
6X


20 GA OVHD
16 GA VERT
HINGED PANEL
29 SUB FRAME
SHEATHING
1 1/2
1/8
HINGE SPCD 18 CTRS (MAX)
28
27 DZUS FSTNR SPCD 18 CTRS (MAX)
SIZE OF PANELS AS REQ'D AT SHIP (SEE NOTE 3)

DETAIL 6C

TYP HINGED PANEL

3 = 12

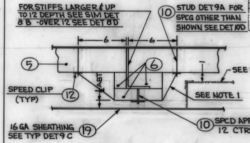

UPPER DK OVER
2
BOSN STRM
4
STEERING GEAR RM
PASSAGE
CORDAGE SPACE
AP
21
30
40
50
58
59
OPEN
OPEN
3
MACHINERY SPACE
3 ABV TANK ONLY
FIRE PUMP RM ACCESS TR
3
3
3
ELEV
3
ESC TR
WATER TANK
1
WATER TANK
PUMP RM ACS TR
3 UNDER UPPER DK
L O TANKS

SEE NOTE 12

DETAIL 6A

78'-4 FLAT

1/16 = 12


FOR STIFFS LARGER & UP TO 12 DEPTH SEE SIM DET 8 B - OVER 12 SEE DET 8 D
10 STUD DET 9A FOR SPCG OTHER THAN SHOWN SEE DET 10D
6
6
5
6
1 ABT
SEE NOTE 11
SPEED CLIP (TYP) 12
SEE NOTE 1
16 GA SHEATHING SEE TYP DET 9 C 19
10 SPCD APPROX 12 CTRS

DETAIL 6 B

THERMAL INSUL ON A60 BHD WITH STIFFS WRAPPED BEHIND SHEATHING

3 = 12

HULL NO. 613C, 614C	DWG NO. 7000-104	REV. C
		SHEET 6

K&E 19 1253 7-74 W 2547 B •

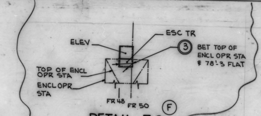
MN15-17X22 (REV. 1)

7000-104

MICRO-MASTER 105 mm

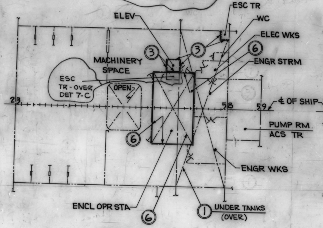
SEPT. '80

6X


ESC TR
ELEV
③ BET TOP OF ENCL OPR STA ¢ 78'-3 FLAT
TOP OF ENCL OPR STA
ENCL OPR STA
FR 48
FR 50

DETAIL 7-C Ⓕ

1/16 = 12

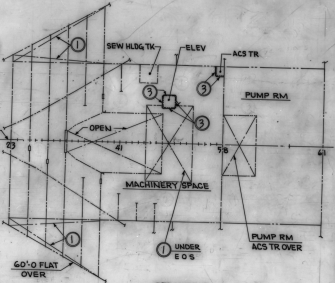

ELEV
ESC TR
WC
ELEC WKS
③
③
⑥
ENGR STRM
MACHINERY SPACE
ESC TR - OVER DET 7-C
OPEN
23
58
59
¢ OF SHIP
PUMP RM ACS TR
⑥
ENGR WKS
ENCL OPR STA
⑥
① UNDER TANKS (OVER)

SEE NOTE 12

DETAIL 7B Ⓕ

60'-0 MACHY FLAT

1/16 = 12


①
SEW HLDG TK
ELEV
ACS TR
③
③
PUMP RM
③
OPEN
23
41
58
61
MACHINERY SPACE
①
PUMP RM ACS TR OVER
① UNDER EOS
60'-0 FLAT OVER

SEE NOTE 12

DETAIL 7A

33'-0 MACHY FLAT

1/16 = 12

K&E 10 1283 7-74 W 2847 B+

HULL NO. 613C, 614C	DWG NO. 7000-104	REV. F
		SHEET 7

MN15-17X22 (REV. 1)

7000-104

MICRO-MASTER 105 mm

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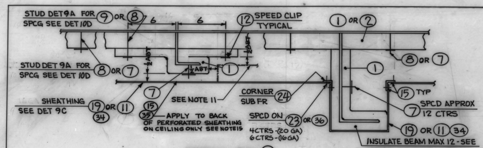
SEPT. '80

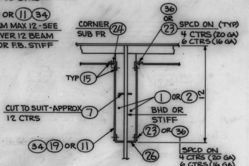
6X


STUD DET 9A FOR ⑨ OR ⑧
SPCG SEE DET 10D
6
6
⑫ SPEED CLIP TYPICAL
① OR ②
2 ABT
2 ABT
2 ABT
①
⑧ OR ⑦
STUD DET 9A FOR ⑧ OR ⑦
SPCG SEE DET 10D
①
CORNER SUB FR ㉔
⑮ TYP
⑦
SEE NOTE 11
SHEATHING ⑲ OR ⑪ ㉞
SEE DET 9C
⑮
㉟ APPLY TO BACK OF PERFORATED SHEATHING ON CEILING ONLY SEE NOTE 15
SPCD ON ㉓ OR ㊱
4 CTRS-(20 GA)
6 CTRS-(16 GA)
⑦ SPCD APPROX 12 CTRS
⑲ OR ⑪ ㉞
INSULATE BEAM MAX 12 - SEE DET 8D FOR OVER 12 BEAM
SEE DET 8C FOR F.B. STIFF

DETAIL 8B Ⓓ

THERMAL INSUL ON PLAIN SURFACE WITH STIFFS WRAPPED BEHIND SHEATHING

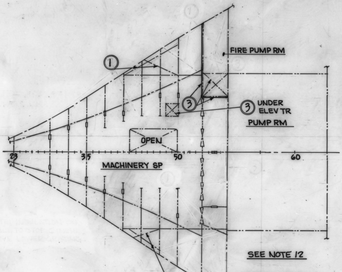
3 = 12


CORNER SUB FR ㉔
㊱ OR ㉓ SPCD ON (TYP)
4 CTRS (20 GA)
6 CTRS (16 GA)
TYP ⑮
① OR ②
BHD OR STIFF
12
CUT TO SUIT-APPROX 12 CTRS ⑦
㉓ OR ㊱
㉞ ⑲ OR ⑪
㉖
SPCD ON
4 CTRS (20 GA)
6 CTRS (16 GA)

DETAIL 8D Ⓓ

12 EXTENSION OF INSUL & SHEATHING ON BHD OR STIFF

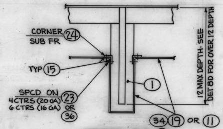
3 = 12


①
FIRE PUMP RM
③
③ UNDER ELEV TR
PUMP RM
OPEN
23
35
50
60
MACHINERY SP
①
SEE NOTE 12

DETAIL 8 A

HOLD

1/16 = 12


CORNER SUB FR ㉔
TYP ⑮
SPCD ON ㉓ OR ㊱
4 CTRS (20 GA)
6 CTRS (16 GA)
①
12 MAX DEPTH - SEE DET 8D FOR OVER 12 DEPTH
㉞ ⑲ OR ⑪

DETAIL 8C Ⓓ

F.B. STIFFS WRAPPED BEHIND SHEATHING

3 = 12

HULL NO. 613C, 614C	DWG NO. 7000-104	REV. D
		SHEET 8

K&E 10 1253 7-74 W 2847 B+

MN15-17X22 (REV. 1)

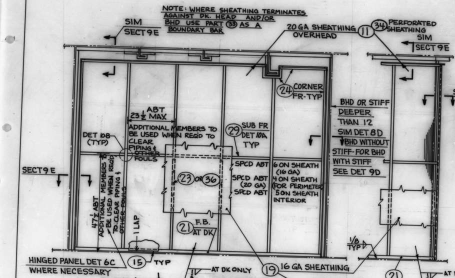
7000-104

MICRO-MASTER 105 mm

K+E

SEPT. '80

6X


NOTE: WHERE SHEATHING TERMINATES AGAINST DK. HEAD AND/OR BHD USE PART 33 AS A BOUNDARY BAR
SIM SECT 9E
20 GA SHEATHING OVERHEAD 11
34 PERFORATED SHEATHING
SIM SECT 9E
24 CORNER FR-TYP
BHD OR STIFF DEEPER THAN 12 SIM DET 8D BHD WITHOUT STIFF-FOR BHD WITH STIFF SEE DET 9D
23½ ABT MAX
ADDITIONAL MEMBERS TO BE USED WHEN REQ'D TO CLEAR PIPING & OTHER FOULS
DET 10B (TYP)
29 SUB FR DET 10A TYP
SPCD ABT
SPCD ABT (20 GA)
SPCD ABT
6 ON SHEATH (16 GA)
4 ON SHEATH (FOR PERIMETER)
5 ON SHEATH INTERIOR
23 OR 36
SECT 9E
47½ ABT
ADDITIONAL MEMBERS TO BE USED WHEN REQ'D TO CLEAR PIPING & OTHER FOULS
1 LAP
21 F.B. AT DK
1/8 TYP
21

HINGED PANEL DET 6C WHERE NECESSARY 15 TYP

ON BHDS & DK HEADS ONLY 1/8 1-6

1/8 AT DK ONLY

19 16 GA SHEATHING

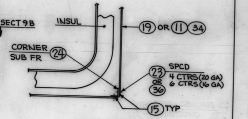
34 PERFORATED SHEATHING

AT DK ONLY 1/8 1-6 ON BHDS & DK HEADS ONLY

DETAIL 9C

TYP FURRING STRIP ARR Ⓓ Ⓔ

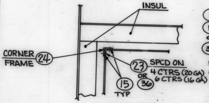
3/4 = 12


INSUL
19 OR 11 34
CORNER SUB FR 24
23 SPCD 4 CTRS (20 GA) OR 36 6 CTRS (16 GA)
15 TYP

SECTION 9B Ⓓ

OUTSIDE RADIUS CORNER

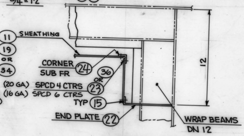
3 = 12


INSUL
CORNER FRAME 24
23 SPCD ON 4 CTRS (20 GA) OR 36 6 CTRS (16 GA)
15 TYP

SECTION 9E Ⓓ

TYPICAL INSIDE CORNER

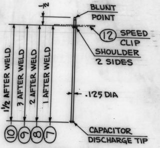
3 = 12


11 19 OR 34 SHEATHING
CORNER SUB FR 24
(20 GA) SPCD 4 CTRS 36 OR 23
(16 GA) SPCD 6 CTRS
TYP 15
END PLATE 22
12
WRAP BEAMS DN 12

DETAIL 9D Ⓓ

TREATMENT 12 DN ON BHD WITH STIFF

3 = 12


½
BLUNT POINT
12 SPEED CLIP
SHOULDER 2 SIDES
1½ AFTER WELD
3 AFTER WELD
2 AFTER WELD
1 AFTER WELD
.125 DIA
10 9 8 7
CAPACITOR DISCHARGE TIP

DETAIL 9A

INSULATION STUD

6 = 12

K&E 10 1253 7-74 W 2847 B

HULL NO. 613C, 614C	DWG NO. 7000-104	REV. E
		SHEET 9

MN15-17X22 (REV. 1)

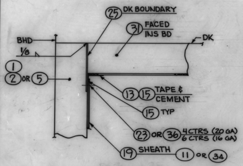
7000-104

MICRO-MASTER 105 mm

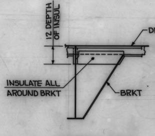
K+E

SEPT. '80

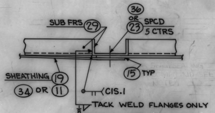
6X


25 DK BOUNDARY
31 FACED INS BD
BHD
DK
1/8
1
2 OR 5
13 15 TAPE & CEMENT
15 TYP
23 OR 36 4 CTRS (20 GA) 6 CTRS (16 GA)
19 SHEATH 11 OR 34

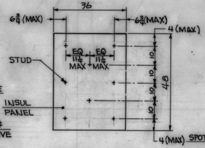
DETAIL 10E
CORNER-SHEATHED INS TO FACED BD INS ⓓ
6=12


12 DEPTH OF INSUL
DK
INSULATE ALL AROUND BRKT
BRKT

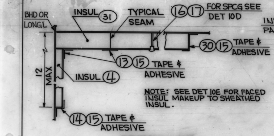
DETAIL 10 C
INSULATION IN WAY OF FRAME
BRACKET -TYPICAL
1/2=12


SUB FRS 29
36 OR 23 SPCD 5 CTRS
SHEATHING 19
34 OR 11
15 TYP
CIS.1
1/8 TACK WELD FLANGES ONLY

DETAIL 10 B ⓓ ⓔ
TYP BUTT OF SUB FRS
FULL SIZE

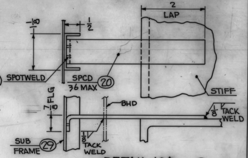

36
6 3/4 (MAX)
6 3/4 (MAX)
4 (MAX)
STUD
EQ 11 1/4 MAX
EQ 11 1/4 MAX
INSUL PANEL
10
10
10
10
10
48
4 (MAX)

DETAIL 10D
TYP STUD SPCG FOR INSUL ⓓ
3/4=12


BHD OR LONGL
INSUL 31
TYPICAL SEAM
16 17 FOR SPCG SEE DET 10D
30 15 TAPE & ADHESIVE
13 15 TAPE & ADHESIVE
INSUL 4
12 MAX
14 15 TAPE & ADHESIVE

NOTE: SEE DET 10E FOR FACED INSUL MAKEUP TO SHEATHED INSUL.

DETAIL 10F
TYPICAL CORNER, BUTT & END CONNECTIONS
ON FACED INSUL ONLY
3=12


2 LAP
1 1/8
1/2
SPOTWELD
SPCD 36 MAX 20
STIFF
7/8 FLG
BHD
1/8 TACK WELD
1/8 TACK WELD
SUB FRAME 29

DETAIL 10A ⓓ
SUB FRAME & SUPPORT
FULL SIZE

HULL NO. 613C, 614C	DWG NO. 7000-104	REV. E
		SHEET 10

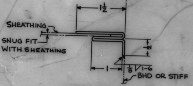
K&E 19 1253 7-74 W2847 B

MN15-17X86 (REV. 1)

7000-104

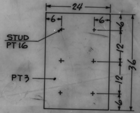
MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80
6X


1½
SHEATHING
SNUG FIT
WITH SHEATHING
½
1
⅛ ◺ 1-6
BHD OR STIFF

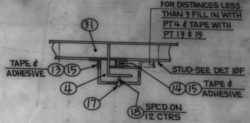
DETAIL 11-C

SHEATHING RETAINER ㉜
STRIP
SCALE 12=1'-0


24
6
6
STUD
PT16
PT3
6
12
12
6
36

DETAIL 11-B

TYP STUD PATTERN FOR
ACOUSTIC INSULATION
1=12


FOR DISTANCES LESS
THAN 3 FILL IN WITH
PT4 & TAPE WITH
PT 13 & 15
㉛
TAPE &
ADHESIVE ⑬⑮
STUD-SEE DET 10F
④
⑭⑮ TAPE &
ADHESIVE
⑰
⑱ SPCD ON
12 CTRS

DETAIL 11A

FACED INSUL ON PLAIN SURFACE
WITH STIFFENER WRAPPED
3=12

K&E 19 1253 7-74 W 2847 B

HULL NO. 613C, 614C	DWG NO. 7000-104	REV. C
		SHEET 11

MN15-17X22 (REV. 1)

7000-104

MICRO-MASTER 105 mm

K+E

SEPT. '80

6X

REPRODUCTION OFFICE

YARD PRINTS ____________ GROUPING ____________

REMARKS ____________

DATE ____________ SIGNED ____________

YARD PRINTS

FIRST ISSUE	DEPT.	NO. PRTS.	REV.	DATE ISSUED	SPECIAL PRINTS
	AH				
	BL				
	BR				
	EL				
	FP				
	MI				
	ML				
	MS				
	PC				
	PM				
	PS				
	PN				
	RD				
	RM				
	MIR				
	SH				
	SM				
	TM				
	WD				
	WE				
	WM				
	CSD				

ORDERED BY DESIGN

GROUP:

MC NO. ____________

GENERAL NOTES

1. ALL INSULATION MATERIALS SHALL BE SELECTED FROM THE APPROVED MATERIALS LISTS NUMBER 164.007 AND 164.009 OF USCG. PUBLICATION NO. 190.

2(A) THERMAL INSULATION SHALL GENERALLY BE AN UNFACED INCOMBUSTIBLE FIBROUS GLASS BLANKET ... USCG CERTIFICATE 164.009/92/0 & 164.009/72/3 ON BOTH FLAT SURFACES AND BEAM WRAP. UNSHEATHED AREAS NOT SUBJECT TO ABUSE SHALL HAVE FACED INSULATION BOARD OF 2.77 # DENSITY (USCG 164.009/126/0).

(B) FIRE INSULATION SHALL BE A FELT MINERAL WOOL OF 7# DENSITY (USCG 164.007/40/0).

(C) ACOUSTIC INSULATION SHALL BE AN INCOMBUSTIBLE FIBROUS GLASS BLANKET, FACED AND OF 1.15# DENSITY (USCG 164.009/165/2) OR UNFACED OF 1.15 # DENSITY (USCG 164.009/165/2) DEPENDING UPON APPLICATION. THE OUTER LAYER IN THE FAN ROOM SHALL BE PERFORATED FIBROUS GLASS CLOTH FACED INSULATION BOARD OF 2.77# DENSITY (MIL-A-23054)

(D) FOR THICKNESSES AND CONFIGURATIONS OF THE ABOVE, SEE APPLICABLE DETAILS.

3. ALL INSULATION SHALL BE IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS: 32-MA-3, MIL-I-724 AND MIL-A-23054, WHERE APPLICABLE.

4. FOR METHODS OF ATTACHMENT AND EXTENT OF INSULATION SEE APPLICABLE DETAILS.

5. ALL JOINTS OF FACED INSULATION SHALL BE TAPED.

6. DEFINITIONS:

"SEALED CONSTRUCTION" MEANS THAT THE FAYING SURFACES BETWEEN THE BULKHEAD PANELS AND ITS OVERHEAD SUPPORT IS CAULKED TO IMPEDE THE TRANSMISSION OF SOUND.

"SOUND STOP" IS A SHEET METAL BARRIER EXTENDING FROM THE TOP OF THE JOINER BULKHEAD TO THE DECKHEAD, SO AS TO IMPEDE THE TRANSMISSION OF SOUND.

ISSUE	
PARTIAL	✓
COMPLETE	

SHEET	1	2	3	3A	4	5	5A	6	7	8	9	10
REVISION	E	E	D	D	B	D	A	A	A	A	E	A

AUTHORITY

DWG. REV. — HULL APPLIC.

REV.	NN HULLS ONLY					
0	613	614	615			
A	613	614	615			
B	YES	YES	YES			
C	YES	YES	YES			
D	YES	YES	YES			
E	YES	YES	No			

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615	311	
614	310	
613	309	

APPROVALS

OWNERS SHELL 3-16-77 G.K. SUMNER
ZAPATA 2-16-77 J.C. PURVIS
NEWPORT NEWS LTR 613C/H 7000 DTD 3-21-77 R.L. HARRINGTON
ABS N.A.
USPHS. 12-3-76 S.R. Runiers
USCG 2-11-77 J.D. VITKAUSKAS

Newport News Shipbuilding
A Tenneco Company

Commercial Ship Division

DESIGN DIV.

FSCM NO. 43689
HULL DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

SCALE AS NOTED = 1 FT
DRAWN G. Hugue
CHECKED HcK
SECT MGR J. T. Caputo
DATE COMPL 1-8-76
EXAMINED T.T. TAYLOR
AUTHORIZED A. CONLEY
DATE 4-25-77
TECH APPROVAL ____________
CSD APPROVAL R.L. HARRINGTON

JOINER INSULATION
FR 44-58

USMA DESIGN T11-S-116a
USMA DWG NO. ____________ HULL NO. 613, 614 & 615

DWG NO. 7000-110
REV E
SHEET NO. 1 OF 10

K&E 19 1253 3-72 2348

MN15-17X22 (REV. 1)

7000-110

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

6X

TABLE OF CONTENTS	
SH NO.	TITLE
1	TITLE SHEET
2	INDEX , REFERENCES , REVISIONS
3&3A	DETAILS
4	UPPER DECK
5	CAMBER HULL 613,614
5A	↓ HULL 615
6	"A"
7	"B"
8	"C"
9	"D"
10	NAV. BRIDGE

NO.	REFERENCES	DWG. NO.
1.	SHIPS REEFER STOREROOM ARRG'T. & DETS.	5450-141
2.	ARRANGEMENT OF ACCOMODATIONS	268576

REVISIONS								
COST CHG NO.		REV	SH NO.	DESCRIPTION	NNS&DD CO		USN	
NN	NAVSHIPS				DATE	AUTHD	DATE	APPD
		A	5 6 7 8 9 10	1) PLAN VIEW REVISED TO SUIT REV. "F" OF REF. #2	3-21-77	RLH	3-16-77 2-10-77	SHELL ZAPATA
79			3 THRU 10	2) ADDED STRUCTURAL FIRE PROTECTIVE INSUL. TO ARRG'TS & DETS.				
			ALL	3) CORRECTED INSUL.				
			5A 3A	ADDED				
		B	3	1) ADD PINS TO ANGLE FLGS. IN DET. 3-A	7-25-77	RLH	6-9-77 6-1-77	SHELL ZAPATA
			5	2) REVISE Ⓡ IN LEGEND TO READ "...SEE DET. 3-R"				
			3	3) ADDED "DET. 3-G" TO FACED FIRE INSULATION DETAILS.				
			3A	4) ADDED PIN INFO. AT DETS 3G & 3H				
			1	5) REVISED GEN. NOTES 1 & 2.				
			4	6) ADD A60 AT STAIRS				
				7) ADDED USCG APPROVAL ITEMS 3, 4, 5 TO SUIT USCG COMMENTS				
			5	8) DELETE A60 ON FOAM ROOM AFT BHD.				
		C	3A	1) REV. DETS. 3-L & 3M TO SUIT USCG REQUEST				
		D	3A	1) REV. DET. 3-J TO SHOW 3" DIMS. TO BE "APPROX."				
			3	2) REV. DETS. TO SHOW PIN LOCATIONS AS "APPROX."				
			5	3) INSUL. IN HOTEL & SUNDRY STORES WAS "F"				
			5	4) A-60 (R) & (GR) INSULATION IN FREEZE RM. EXTENDED AFT. TO COVER ENTIRE DEPTH OF FREEZE RM. R.M. 9-1-77				
129		E	9	1) ADDED FACED THERMAL INSUL. TO D DK P/S STRUCTURAL VOIDS FOR H613/14 ONLY.				

HULL NO. 613, 614, 615	DWG. NO. 7000-110	REV. E
		SHEET 2

HN14-17 X 22 (REV. 1)

7000-110

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade mark of KEUFFEL & ESSER CO

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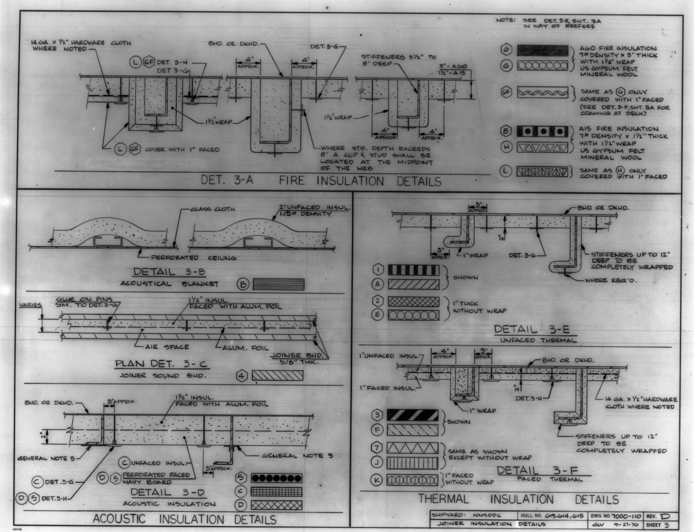
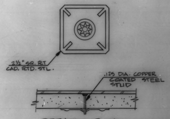

NOTE: SEE DET. 3-R, SHT. 3A IN WAY OF REEFERS
14 GA. x 1/2" HARDWARE CLOTH WHERE NOTED
L 6F DET. 3-H
DET 3-G
BHD. OR DKHD.
DET. 3-G
4" APPROX.
4" APPROX.
STIFFENERS 5 1/2" TO 8" DEEP
3" - A60
1 1/2" - A15
1 1/2" WRAP
1 1/2" WRAP
4" APPROX.
4" APPROX.
L 6F COVER WITH 1" FACED
WHERE STIF. DEPTH EXCEEDS 8" A CLIP & STUD SHALL BE LOCATED AT THE MIDPOINT OF THE WEB
DET. 3-A FIRE INSULATION DETAILS
6 A60 FIRE INSULATION 7# DENSITY x 3" THICK WITH 1 1/2" WRAP
G US GYPSUM FELT MINERAL WOOL
6F SAME AS 6 ONLY COVERED WITH 1" FACED (SEE DET. 3-P, SHT. 3A FOR COAMING AT DECK)
8 A15 FIRE INSULATION 7# DENSITY x 1 1/2" THICK WITH 1 1/2" WRAP
H US GYPSUM FELT MINERAL WOOL
L SAME AS H ONLY COVERED WITH 1" FACED
GLASS CLOTH
2" UNFACED INSUL. 1.15# DENSITY
PERFORATED CEILING
DETAIL 3-B
ACOUSTICAL BLANKET B
VARIES
GLUE ON PINS SIM. TO DET. 3-G
1 1/2" INSUL. FACED WITH ALUM. FOIL
AIR SPACE
ALUM. FOIL
JOINER BHD. 5/8" THK.
PLAN DET. 3-C
JOINER SOUND BHD. 4
BHD. OR DKHD.
3" APPROX.
1 1/2" INSUL. FACED WITH ALUM. FOIL
2"
GENERAL NOTE 5
GENERAL NOTE 5
C UNFACED INSUL.
D 5 PERFORATED FACED NAVY BOARD
3" APPROX.
C DET. 3-G
D 5 DET. 3-H
DETAIL 3-D
ACOUSTIC INSULATION
5
C
D
ACOUSTIC INSULATION DETAILS
3" APPROX.
BHD. OR DKHD.
3" APPROX.
1" WRAP
DET. 3-G
"N
STIFFENERS UP TO 12" DEEP TO BE COMPLETELY WRAPPED
WHERE REQ'D.
1 A SHOWN
2 E 1" THICK WITHOUT WRAP
DETAIL 3-E
UNFACED THERMAL
1" UNFACED INSUL.
4" APPROX.
3" APPROX.
BHD. OR DKHD.
1" FACED INSUL.
"N
DET. 3-H
1" WRAP
14 GA. x 1/2" HARDWARE CLOTH WHERE NOTED
STIFFENERS UP TO 12" DEEP TO BE COMPLETELY WRAPPED
3 F SHOWN
7 J SAME AS SHOWN EXCEPT WITHOUT WRAP
K 1" FACED WITHOUT WRAP
DETAIL 3-F
FACED THERMAL
THERMAL INSULATION DETAILS
N2413b
MN15-17X22 (REV. 1)

SHIPYARD: NNSDDC	HULL NO. 613,614,615	DWG NO. 7000-110	REV. D
JOINER INSULATION DETAILS		GLV 9-27-76	SHEET 3

7000-110

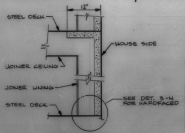
SEPT. '80

6X


2½" SQ. PT
CAD. PTD. STL.
.125 DIA. COPPER COATED STEEL STUD

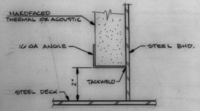
DETAIL 3-G

SHEATHED AREAS


12"
STEEL DECK
HOUSE SIDE
JOINER CEILING
JOINER LINING
STEEL DECK
SEE DET. 3-N FOR HARDFACED

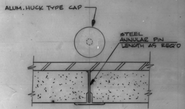
DETAIL 3-K

THERMAL & ACOUSTIC


HARDFACED THERMAL OR ACOUSTIC
16 GA ANGLE
STEEL BHD.
2"
TACKWELD
STEEL DECK

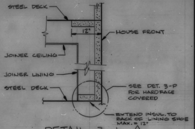
HARDFACED THERMAL OR ACOUSTIC INSULATION AT DECK

DETAIL 3-N


ALUM. HUCK TYPE CAP
STEEL ANNULAR PIN LENGTH AS REQ'D

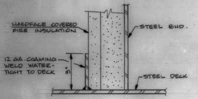
DETAIL 3-H

UNSHEATHED AREAS


STEEL DECK
12"
HOUSE FRONT
JOINER CEILING
JOINER LINING
STEEL DECK
SEE DET. 3-P FOR HARDFACE COVERED
EXTEND INSUL. TO BACK OF LINING SHOE MAX. = 12"

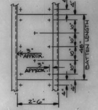
DETAIL 3-L △C

FIRE (ELEVATION)


HARDFACE COVERED FIRE INSULATION
STEEL BHD.
12 GA. COAMING WELD WATER-TIGHT TO DECK
3"
STEEL DECK

HARDFACE COVERED FIRE INSULATION AT DECK

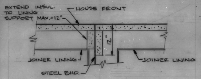
DETAIL 3-P


4"
10"
10"
10"
10"
4"
48"
BATTEN LENGTH
3" APPROX.
3" APPROX.
2'-6"

DETAIL 3-J

TYP. PIN SPACING

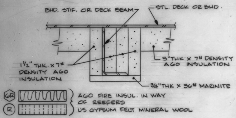
PIN DETAILS


EXTEND INSUL. TO LINING SUPPORT MAX. = 12"
HOUSE FRONT
12"
JOINER LINING
JOINER LINING
STEEL BHD.

DETAIL 3-M △C

FIRE (PLAN VIEW)

EXTENT DETAILS


BHD. STIF. OR DECK BEAM
STL. DECK OR BHD.
1½" THK. x 7# DENSITY A60 INSULATION
3" THK x 7# DENSITY A60 INSULATION
¾" THK x 36# MARINITE
6R
A60 FIRE INSUL. IN WAY OF REEFERS
R
US GYPSUM FELT MINERAL WOOL

DETAIL 3-R

SHIPYARD: NNSDDC	HULL NO. 613, 614, 615	DWG NO. 7000-110	REV. D
JOINER INSULATION DETAILS		GLV 9-28-76	SHEET 3A

N24136

MN15-17X32 (REV. 1)

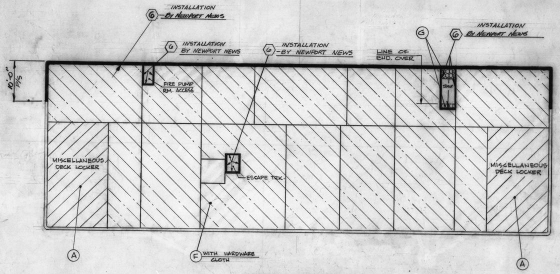
7000-110

SEPT. '80

6X

INSULATION SYMBOLS

BULKHEAD		LEGEND	DECKHEAD LEGEND		
3	▨	2" FACED TEMP W/ 1" WRAP	F	▨	2" FACED TEMP. W/1 WRAP.
6	■	A-60 -3" INSUL. W/1½ WRAP	A	▨	2" TEMP W/ 1" WRAP
			G	⬡	A-60 3" W/ 1½" WRAP


6 INSTALLATION BY NEWPORT NEWS
6 INSTALLATION BY NEWPORT NEWS
6 INSTALLATION BY NEWPORT NEWS
G
6 INSTALLATION BY NEWPORT NEWS
LINE OF BHD. OVER
10'-0" P/S
FIRE PUMP RM. ACCESS
STAIR
MISCELLANEOUS DECK LOCKER
ESCAPE TRK.
MISCELLANEOUS DECK LOCKER
A
F WITH HARDWARE CLOTH
A

UPPER DECK

UPPER DECK

TITLE	HULLS	SHIPYARD	HB DWG No.	SHEET	REV.
JOINER INSULATION UPPER DECK	613, 614, 615	NNSDDC	7000-110	4	B

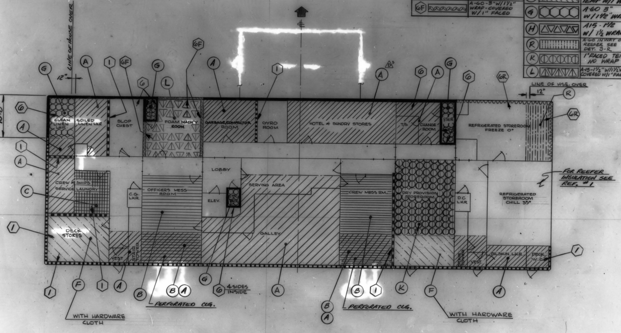
7000-110

SEPT. '80

6X

INSULATION SYMBOLS

BULKHEAD LEGEND			DECKHEAD LEGEND		
1	▥	2" TEMP. W/1" WRAP	A	▨	2" TEMP W/1" WRAP
2	▩	1" TEMP W/NO WRAP	B	▤	2" ACOUSTICAL BLANKET
3	▰	2" FACED TEMP W/1" WRAP	C	▦	3½" SOUND NOT PERFORATED
4	▧	1½" SOUND W/AIR SPACE	D	▩	3½" SOUND PERFORATED
5	●●●●●	3½ SOUND PERFORATED	E	○○○○	1" TEMP. NO. WRAP
6	■	A-60-3" W/1½ WRAP	F	▧	2" FACED TEMP W/1" WRAP
6R	∿∿∿	A-60 IN WAY OF REEFER SEE DET. 3-R	G	⬡⬡⬡⬡	A-60 3" W/1½" WRAP
6F	∿∿∿	A-60-3" W/1½" WRAP-COVERED W/1" FACED	H	△▽△▽△▽	A15-1½ W/1½ WRAP
			R	▥	A-60 IN WAY OF REEFER SEE DET. 3-R
			K	⦶⦶⦶⦶⦶	1" FACED TEMP NO WRAP
			L	△▽△▽△	A-15-1½" W/1½" WRAP COVERED W/1" FACED


LINE OF HOUSE OVER
12"
10'-0"
G
A
1
6F
G
6
L
6F
A
1
A
D3
6
A
G
6
6R
LINE OF HSE. OVER
12"
R
6R
6
A
1
A
C
1
CLEAN LINEN LKR
SOILED LINEN LKR
SLOP CHEST
ACCESS
FOAM MACH'Y ROOM
GARBAGE/COMPACTOR ROOM
GYRO ROOM
HOTEL & SUNDRY STORES
T/S
CHANGE ROOM
STAIR
REFRIGERATED STOREROOM FREEZE 0°
LOBBY
CREW & SHIPS SERVICE LAUNDRY
C.G. LKR.
OFFICER'S MESS ROOM
ELEV.
ESC. TRK.
SERVING AREA
CREW MESS RM.
DRY PROVISION STOREROOM
D.C. LKR
REFRIGERATED STOREROOM CHILL 35°
FOR REEFER INSULATION SEE REF. #1
DECK STORES
VEST
STAIR TOWER
GALLEY
STAIR TOWER
VEST.
OILSKIN LKR.
DECK W.C.
1
1
F
1
A
B
B
A
PERFORATED CLG.
G
6
4 SIDES INSIDE
A
B
A
B
1
PERFORATED CLG.
K
F
A
WITH HARDWARE CLOTH
WITH HARDWARE CLOTH

CAMBER DECK △A¹

HULL 613 & 614
SEE SHT. 5A FOR 615 DIFFERENCE

SHIPYARD: N.N.S.D.D.C.	HULL NO. 613, 614	DWG NO. 7000-110	REV. D
TITLE: JOINER INSULATION-CAMBER DECK-		DWN. BY. G. HINKLE	SHEET 5

N2413b

MN15-17X22 (REV. 1)

7000-110

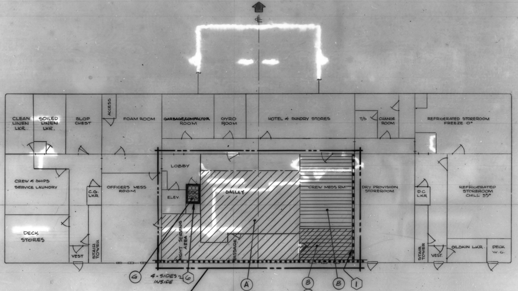
MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
Registered trade mark Keuffel & Esser Co

SEPT. '80

6X

INSULATION SYMBOLS

BULKHEAD LEGEND			DECKHEAD LEGEND		
1	▮	2" TEMP W/1" WRAP	A	▨	2" TEMP W/1" WRAP
2	▨	1" TEMP W/NO WRAP	B	☰	2" ACOUSTICAL BLANKET
G	■	A-60 3" W/1½" WRAP	E	○○○○○	1" TEMP NO WRAP
			G	⬡⬡⬡⬡	A-60 3" W/1½" WRAP


CLEAN LINEN LKR.
SOILED LINEN LKR.
SLOP CHEST
ACCESS
FOAM ROOM
GARBAGE/COMPACTOR ROOM
GYRO ROOM
HOTEL & SUNDRY STORES
T/S
CHANGE ROOM
REFRIGERATED STOREROOM FREEZE 0°
CREW & SHIPS SERVICE LAUNDRY
C.G. LKR.
OFFICER'S MESS ROOM
LOBBY
ELEV.
GALLEY
CREW MESS RM.
DRY PROVISION STOREROOM
D.C. LKR.
REFRIGERATED STOREROOM CHILL 35°
DECK STORES
VEST
STAIR TOWER
NIGHT SERVING AREA
PASSAGE
STAIR TOWER
VEST.
OILSKIN LKR.
DECK W.C.
G
4-SIDES INSIDE
G
A
B
A
B
1

CAMBER DECK

HULL 615

SEE SHT. 5 FOR INSULATION
OUTSIDE THIS AREA

SHIPYARD: N.N.S.D.D.C	HULL NO. 615	DWG NO. 7000-110	REV. A
TITLE: JOINER INSULATION -	CAMBER DECK	DWN. BY: GLV	SHEET 5A

N24126

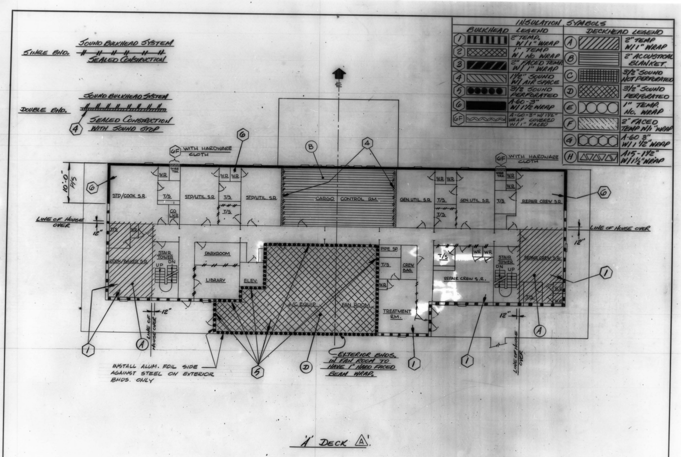
MN15-17X22 (REV. 1)

7000-110

MICRO-MASTER® 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK
® Registered trade-mark of KEUFFEL & ESSER CO.

SEPT. '80

6X


SOUND BULKHEAD SYSTEM
SINGLE BHD.
SEALED CONSTRUCTION
SOUND BULKHEAD SYSTEM
DOUBLE BHD.
SEALED CONSTRUCTION WITH SOUND STOP
4
6F WITH HARDWARE CLOTH
6
10'-0" P/S
LINE OF HOUSE OVER
12"
WIRE TRK.
W.R.
T/S
CG LKR
STD/COOK S.R.
STD/UTIL. S.R.
CARGO CONTROL RM.
GEN.UTIL. S.R.
REPAIR CREW S.R.
B
COOK/BAKER S.R.
STAIR TOWER
UP
DN
DARKROOM
LIBRARY
ELEV.
A/C EQUIP
FAN ROOM
PIPE SP.
CREW BAG.
TREATMENT RM.
1
A
5
D
LINE OF HOUSE OVER

INSTALL ALUM. FOIL SIDE AGAINST STEEL ON EXTERIOR BHDS. ONLY

EXTERIOR BHDS. IN FAN ROOM TO HAVE 1" HARD FACED BEAM WRAP.

INSULATION SYMBOLS

BULKHEAD LEGEND		
1	▥	2" TEMP. W/1" WRAP
2	▩	1" TEMP W/ NO WRAP
3	▨	2" FACED TEMP. W/1" WRAP
4	▧	1½" SOUND W/ AIR SPACE
5	●●●●●	3½ SOUND PERFORATED
6	■	A-60-3" W/1½ WRAP
6F	〰	A-60-3" W/1½" WRAP COVERED W/1" FACED

DECKHEAD LEGEND		
A	▨	2" TEMP W/1" WRAP
B	▤	2" ACOUSTICAL BLANKET
C	▦	3½" SOUND NOT PERFORATED
D	▩	3½" SOUND PERFORATED
E	○○○○	1" TEMP. NO. WRAP
F	▧	2" FACED TEMP W/1" WRAP
G	⬡⬡⬡⬡	A-60 3" W/1½" WRAP
H	△▽△▽	A15-1½" W/1½" WRAP

'A' DECK A

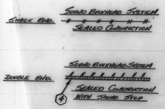
SHIPYARD: N.N.S.D.D.C.	HULL NO. 613, 614, & 615	DWG NO. 7000-110	REV. A
TITLE: JOINER INSULATION - 'A' DECK -		G. Hinkle 5/27/76	SHEET 6

MN15-17X22 (REV. 1)

7000-110

SEPT. '80

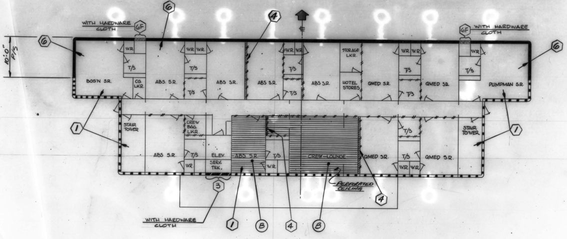
6X


SINGLE BHD.
SOUND BULKHEAD SYSTEM
SEALED CONSTRUCTION
DOUBLE BHD.
SOUND BULKHEAD SYSTEM
SEALED CONSTRUCTION
WITH SOUND STOP
4

INSULATION SYMBOLS

BULKHEAD LEGEND		
1	▥	2" TEMP. W/1" WRAP
2	▩	1" TEMP W/ NO WRAP
3	▰	2" FACED TEMP. W/1" WRAP
4	▧	1½" SOUND W/ AIR SPACE
5	●●●●●	3½ SOUND PERFORATED
6	■	A-60-3" W/ 1½ WRAP
6F	∿∿∿	A-60-3" W/1½" WRAP COVERED W/1" FACED

DECKHEAD LEGEND		
A	▨	2" TEMP W/1" WRAP
B	▤	2" ACOUSTICAL BLANKET
C	▦	3½" SOUND NOT PERFORATED
D	▩	3½" SOUND PERFORATED
E	○○○○	1" TEMP. NO. WRAP
F	▧	2" FACED TEMP W/1" WRAP
G	⬡⬡⬡⬡	A-60 3" W/ 1½" WRAP
H	△▽△▽△▽	A15-1½" W/ 1½" WRAP


WITH HARDWARE CLOTH
6F
6
4
℄
WITH HARDWARE CLOTH
6F
6
10'-0" P/S
6
W.R.
T/S
BOS'N S.R.
CG. LKR.
ABS. S.R.
W.R.
W.R.
T/S
T/S
ABS S.R.
ABS S.R.
W.R.
W.R.
T/S
T/S
ABS S.R.
STORAGE LKR.
HOTEL STORES
QMED. S.R.
W.R.
W.R.
T/S
T/S
QMED S.R.
W.R.
T/S
PUMPMAN S.R.
6
1
STAIR TOWER
ABS S.R.
CREW BAG. LKR.
T/S
W.R.
ELEV.
SERV. TRK.
ABS S.R.
T/S
W.R.
CREW LOUNGE
QMED S.R.
T/S
T/S
W.R.
W.R.
QMED S.R.
STAIR TOWER
1
3
PERFORATED CEILING
4
WITH HARDWARE CLOTH
1
B
4
B

'B' DECK A'

SHIPYARD: N.N.S.D.D.C.	HULL NO. 613, 614 & 615	DWG NO. 7000-110	REV. A
TITLE: JOINER INSULATION - 'B' DECK -		G. HINKLE 5/27/76	SHEET 7

MN15-17X22 (REV. 1)

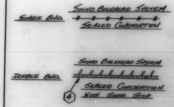
7000-110

MICRO-MASTER 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

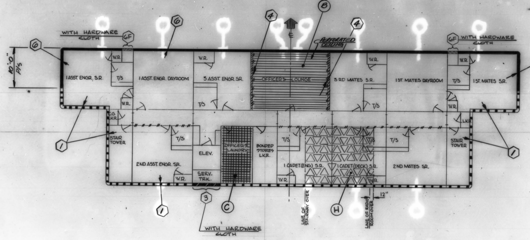
SEPT. '80

6X


SINGLE BHD.
SOUND BULKHEAD SYSTEM
SEALED CONSTRUCTION
DOUBLE BHD.
SOUND BULKHEAD SYSTEM
SEALED CONSTRUCTION
WITH SOUND STOP
4

INSULATION SYMBOLS

BULKHEAD LEGEND			DECKHEAD LEGEND		
1	▥	2" TEMP. W/1" WRAP	A	▨	2" TEMP W/1" WRAP
2	▩	1" TEMP W/ NO WRAP	B	▤	2 ACOUSTICAL BLANKET
3	▨	2" FACED TEMP. W/1" WRAP	C	▦	3½" SOUND NOT PERFORATED
4	▧	1½" SOUND W/ AIR SPACE	D	▩	3½" SOUND PERFORATED
5	●●●●●	3½ SOUND PERFORATED	E	○○○○	1" TEMP. NO. WRAP
6	■	A-60-3" W/ 1½ WRAP	F	▧	2" FACED TEMP W/1" WRAP
6F	∿∿∿	A-60-3" W/ 1½" WRAP COVERED W/1" FACED	G	⬡⬡⬡⬡	A-60 3" W/1½" WRAP
			H	△▽△▽△▽	A/5-1½" W/1½" WRAP


WITH HARDWARE CLOTH
6F
6
6
10'-0" P/S
1 ASST. ENGR. S.R.
W.R.
T/S
W.R.
1 ASST. ENGR. DAYROOM
W.R.
3 ASST. ENGR. SR.
T/S
4
C.G. LKR.
STAIR TOWER
1
T/S
2 ND. ASST. ENGR. SR.
W.R.
ELEV.
SERV. TRK.
OFFICERS LAUNDRY
BONDED STORES LKR.
1
3
C
WITH HARDWARE CLOTH
B
℄
PERFORATED CEILING
4
OFFICERS LOUNGE
T/S
1 CADET (ENG) S.R.
W.R.
1 CADET (DECK) S.R.
W.R.
LINE OF STAIRWAY OVER
H
LINE OF RADIO ROOM OVER
12"
3 RD MATES S.R.
T/S
T/S
2 ND. MATES SR.
1 ST. MATES DAYROOM
6F
WITH HARDWARE CLOTH
W.R.
T/S
1 ST. MATES S.R.
W.R.
LKR.
STAIR TOWER
6
1

'C' DECK A'

SHIPYARD N.N.S.D.D.C.	HULL NO. 613, 614 & 615	DWG NO. 7000-110	REV. A
JOINER INSULATION -'C' DECK -		G. Hinkle 5/28/76	SHEET 8

N24136

MN15-17X22 (REV. 1)

7000-110

SEPT. '80

6X

SOUND BULKHEAD SYSTEM

SINGLE BHD. —‖—‖—‖—‖—‖—‖—

SEALED CONSTRUCTION

SOUND BULKHEAD SYSTEM

DOUBLE BHD.

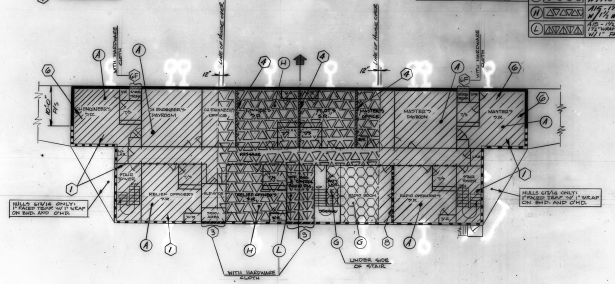
SEALED CONSTRUCTION

④ WITH SOUND STOP

INSULATION SYMBOLS

BULKHEAD LEGEND		
1	▥	2" TEMP. W/1" WRAP
2	▩	1" TEMP W/NO WRAP
3	▰	2" FACED TEMP W/1" WRAP
4	▧	1½" SOUND W/AIR SPACE
5	●●●●●	3½ SOUND PERFORATED
6	■	A-60 3" W/1½ WRAP
8	▮●▮●▮●	A15 - 1½ W/1½ WRAP
6F	∿∿∿	A60-3" W/1½" WRAP COVERED W/1" FACED

DECKHEAD LEGEND		
A	▨	2" TEMP W/1" WRAP
B	▤	2" ACOUSTICAL BLANKET
C	▦	3½" SOUND NOT PERFORATED
D	▩	3½" SOUND PERFORATED
E	○○○○	1" TEMP. NO. WRAP
F	▧	2" FACED TEMP W/1" WRAP
G	⬡⬡⬡⬡	A-60 3" W/1½" WRAP
H	△▽△▽△▽	A15 - 1½ W/1½ WRAP
L	△▽△▽△	A15 - 1½" W/1½" WRAP COVERED W/1" FACED


WITH HARDWARE CLOTH
LINE OF HOUSE OVER
12"
LINE OF HOUSE OVER
12"
WITH HARDWARE CLOTH
6
A
6F
A
4
H
4
4
A
6F
6
6
A
10'-0" P/S
CH. ENGINEER'S S.R.
W.R.
WIRE TRUNK
T/S
CH. ENGINEER'S DAYROOM
CH. ENGINEER'S OFFICE
OWNER'S S.R.
W.R.
T/S
PILOT'S S.R.
W.R.
T/S
MASTER'S OFFICE
SAFE
MASTER'S DAYROOM
WIRE TRUNK
W.R.
T/S
MASTER'S S.R.
C.O. LKR.
PASSAGE
LKR.
STAIR TOWER
DN
T/S
RELIEF OFFICER'S S.R.
W.R.
ELEVATOR
SERV. AREA
T/S
RELIEF OFFICER'S S.R.
W.R.
OFF. ENG. & CONTROL EQUIP. RM.
UP
BATT. LKR.
STAIRWAY
RADIO ROOM
RADIO OPERATOR'S S.R.
T/S
W.R.
STAIR TOWER
DN
1
1
HULLS 613/14 ONLY: 1" FACED TEMP. W/1" WRAP ON BHD. AND O'HD.
HULLS 613/14 ONLY: 1" FACED TEMP W/1" WRAP ON BHD. AND O'HD.
A
1
3
H
L
3
G
G
8
A
WITH HARDWARE CLOTH
UNDER SIDE OF STAIR

'D' DECK A'

SHIPYARD: N.N.S.D.D.C.	HULL NO. 613, 614 & 615	DWG NO. 7000-110	REV. E
TITLE: JOINER INSULATION - 'D' DECK -		G. Hinkle 5/28/76	SHEET 9

N24136

MN15-17X22 (REV. 1)

7000-110

SEPT. '80

6X

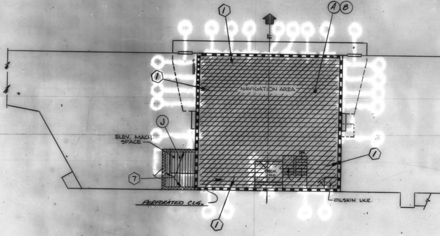
INSULATION SYMBOLS

BULKHEAD LEGEND

①	▥	2" TEMP. W/1" WRAP
②	▩	1" TEMP W/NO WRAP
③	■	2" FACED TEMP W/1" WRAP
④	▧	1½" SOUND W/AIR SPACE
⑤	●●●●●	3½ SOUND PERFORATED
⑥	■	A-60 3" W/1½ WRAP
⑦	⋀⋀⋀⋀	2" TEMP FACED W/NO WRAP

DECKHEAD LEGEND

Ⓐ	▨	2" TEMP W/1" WRAP
Ⓑ	▤	2" ACOUSTICAL BLANKET
Ⓒ	▦	3½" SOUND NOT PERFORATED
Ⓓ	▩	3½" SOUND PERFORATED
Ⓔ	○○○○	1" TEMP. NO. WRAP
Ⓕ	▧	2" FACED TEMP W/1" WRAP
Ⓖ	⬡⬡⬡⬡	A-60 3" W/1½" WRAP
Ⓗ	△▽△▽	A15- 1½" W/1½ WRAP
Ⓙ	▥	2" TEMP FACED W/NO WRAP


1
A
B
1
NAVIGATION AREA
J
ELEV. MACH. SPACE
7
CHECK W.C.
1
PERFORATED CLG.
OILSKIN LKR.
1

NAV. BRIDGE DECK A'

7000-110
613-15
P4

SHIPYARD N.N.S.D.D.C.	HULL NO. 613, 614 & 615	DWG NO. 7000-110	REV. A
JOINER INSULATION	NAV. BRIDGE DECK	G. Hinkle 5/28/76	SHEET 10

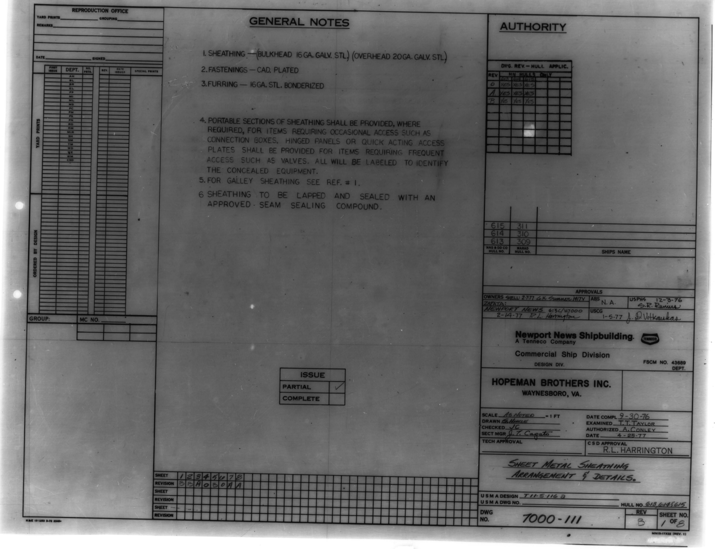
MN15-17X22 (REV. 1)

N24136

7000-110

SEPT. '80

6X



REPRODUCTION OFFICE

YARD PRINTS ______ GROUPING ______

REMARKS ______

DATE ______ SIGNED ______

	FIRST ISSUE	DEPT.	NO. PRTS.	REV.	DATE ISSUED	SPECIAL PRINTS
YARD PRINTS		AH				
		BL				
		BR				
		EL				
		FP				
		MI				
		ML				
		MS				
		PC				
		PM				
		PS				
		PN				
		RD				
		RM				
		MIR				
		SH				
		SM				
		TM				
		WD				
		WE				
		WM				
		CSD				
ORDERED BY DESIGN						

GROUP: MC NO. ______

GENERAL NOTES

1. SHEATHING — (BULKHEAD 16 GA. GALV. STL.) (OVERHEAD 20 GA. GALV. STL.)
2. FASTENINGS — CAD. PLATED
3. FURRING — 16 GA. STL. BONDERIZED

4. PORTABLE SECTIONS OF SHEATHING SHALL BE PROVIDED, WHERE REQUIRED, FOR ITEMS REQUIRING OCCASIONAL ACCESS SUCH AS CONNECTION BOXES. HINGED PANELS OR QUICK ACTING ACCESS PLATES SHALL BE PROVIDED FOR ITEMS REQUIRING FREQUENT ACCESS SUCH AS VALVES. ALL WILL BE LABELED TO IDENTIFY THE CONCEALED EQUIPMENT.
5. FOR GALLEY SHEATHING SEE REF. # 1.
6. SHEATHING TO BE LAPPED AND SEALED WITH AN APPROVED SEAM SEALING COMPOUND.

ISSUE	
PARTIAL	✓
COMPLETE	

SHEET	1	2	3	4	5	6	7	8
REVISION	B	B	A	0	B	0	A	A

AUTHORITY

REV	DWG. REV. — HULL APPLIC. NN HULLS ONLY 613	614	615
0	YES	YES	YES
A	YES	YES	YES
B	YES	YES	YES

NNS & DD CO HULL NO.	MARAD HULL NO.	SHIPS NAME
615	311	
614	310	
613	309	

APPROVALS

OWNERS SHELL: 2-7-77 G.K. Sumner 1417Y
ZAPATA:
NEWPORT NEWS 613C/H7000 2-14-77 R.L. Harrington
ABS N. A.
USPHS 12-3-76 S.R. Runius
USCG 1-5-77 J. D. Vitkauskas

Newport News Shipbuilding.
A Tenneco Company
Commercial Ship Division
DESIGN DIV.
FSCM NO. 43689
DEPT.

HOPEMAN BROTHERS INC.
WAYNESBORO, VA.

SCALE As Noted = 1 FT
DRAWN G. Hinkle
CHECKED JC
SECT MGR J. T. Caputo
TECH APPROVAL
DATE COMPL. 9-30-76
EXAMINED T.T. TAYLOR
AUTHORIZED A. CONLEY
DATE 4-25-77
C S D APPROVAL R.L. HARRINGTON

SHEET METAL SHEATHING ARRANGEMENT & DETAILS.

U S M A DESIGN T11-S-116 2
U S M A DWG NO.
HULL NO. 613, 614 & 615
DWG NO. 7000-111
REV B
SHEET NO. 1 OF 8

MN15-17X22 (REV. 1)

K&E 10 1203 3-72 2340

7000-111

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
ALEXANDRIA • RICHMOND • NORFOLK

SEPT. '80

6X

TABLE OF CONTENTS	
SH NO.	TITLE
1	TITLE SHEET
2	REVISIONS & REFERENCES
3	DETAILS
4	UPPER DECK
5	CAMBER ↓
6	"D"

NO.	REFERENCES	DWG. NO.
1.	GALLEY SHEATHING & DETAILS →	7500-383
2.	SHIPS REEFER STOREROOM ARRG'T. & DETAILS →	5450-141
3	JOINER ARRANGEMENT CAMBER DECK →	5200-61
4	JOINER INSULATION →	7000110
5	JOINER ARRANGEMENT 'B' DECK	5200-63
6	↓ ↓ 'C' DECK	520064
7	'D' DECK	520065

REVISIONS								
COST CHG NO.		REV	SH NO.	DESCRIPTION	NNS&DD CO		OWNERS	
NN	NAVSHIPS				DATE	AUTHD	DATE	APPD
		0	1 THRU 6	SUBMITTED FOR APPROVAL	2/14/77	RLH	2/7/77	SHELL
		A	1,2 7,8	ADDED SHT. 7 & 8 SHOWING SHEATHING IN HOTEL STORES ON 'B' DK AND IN BONDED STORES LKR. ON 'C' DECK.				
			1	ADD NOTE ⓒ	7-25-77	RLH	6-9-77	SHELL
			3	ADD "APPROVED SEALER..."			5-31-77	ZAPATA
		B	5	1) ADD CEILING TO HOTEL & SUNDRY STORES				

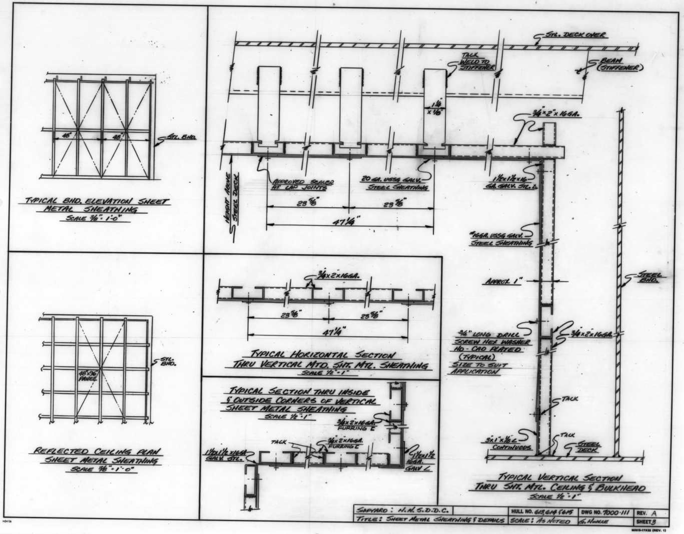
SHIPYARD N.N.S.D.D.C	HULL NO. 613, 614, 615	DWG. NO. 7000111	REV. B
	SHT. MTL. SHEATHING & DETAILS		SHEET 2

NN14-17 X 22 (REV. 1)

7000-111

SEPT. '80

6X



TYPICAL BHD. ELEVATION SHEET METAL SHEATHING
SCALE 3/8" = 1'-0"

REFLECTED CEILING PLAN SHEET METAL SHEATHING
SCALE 3/8" = 1'-0"

TYPICAL HORIZONTAL SECTION THRU VERTICAL MTD. SHT. MTL. SHEATHING
SCALE 1/2" = 1"

TYPICAL SECTION THRU INSIDE & OUTSIDE CORNERS OF VERTICAL SHEET METAL SHEATHING
SCALE 1/2" = 1"

TYPICAL VERTICAL SECTION THRU SHT. MTL. CEILING & BULKHEAD
SCALE 1/2" = 1"

46"
48"
STL. BHD.
48"x96" PANEL
STL. BHD.
STL. DECK OVER
TACK WELD TO STIFFENER
BEAM (STIFFENER)
1¼" x 1/8"
3/4" x 2" x 16 GA.
APPROVED SEALER AT LAP JOINTS
20 GA. USSG GALV. STEEL SHEATHING
1½x1½x16 GA. GALV. STL. ∠
23 5/8"
23 5/8"
47¼"
HEIGHT ABOVE STEEL DECK
#16GA. USSG GALV. STEEL SHEATHING
APPROX 1"
STEEL BHD.
3/4" LONG DRILL SCREW HEX WASHER HD - CAD PLATED (TYPICAL) SIZE TO SUIT APPLICATION
3/4"x2"x16GA.
TACK
3"x1"x1/8" ∠ CONTINUOUS
TACK
STEEL DECK
3/4x2"x16GA.
23 5/8"
23 5/8"
47¼"
3/4"x2"x16GA. FURRING ⊏
TACK
3/4"x2"x16GA. FURRING ⊏
1½x1½x16GA GALV. STL.
1½x1½ 16GA. GALV ∠

SHIPYARD: N.N.S.D.D.C.		HULL NO. 613, 614 & 615	DWG NO. 7000-111	REV. A
TITLE: SHEET METAL SHEATHING & DETAILS		SCALE: AS NOTED	G. HINKLE	SHEET 3

N24136

MN15-17X22 (REV. 1)

7000-111

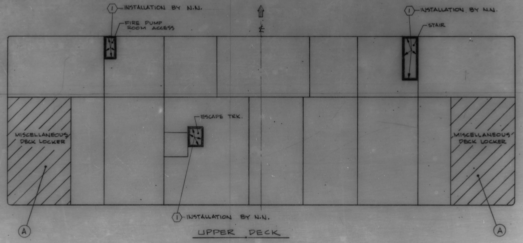
MICRO-MASTER 105 mm

K+E

SEPT. '80

6X

SHEATHING LEGEND					
BULKHEAD			DECKHEAD		
⟨1⟩	■	16 GA. GALV. STL.	Ⓐ	▨	20 GA. GALV. STL.


1 - INSTALLATION BY N.N.
FIRE PUMP ROOM ACCESS
℄
1 - INSTALLATION BY N.N.
STAIR
ESCAPE TRK.
MISCELLANEOUS DECK LOCKER
MISCELLANEOUS DECK LOCKER
1 - INSTALLATION BY N.N.
A
A

UPPER DECK

SHIPYARD: N.N.S.D.D.C.	HULL NO. 613/614/615	DWG. NO. 7000-111	REV. 0
TITLE: SHT. MTL. SHEATHING & DETAILS - UPPER DECK		DRAWN BY: GLW	SHT. 4

7000-111

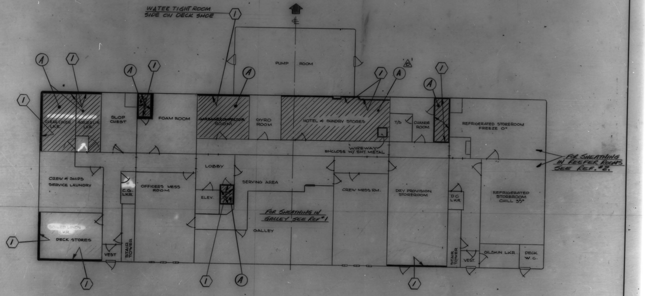
MICRO-MASTER 105 mm

SEPT. '80

6X

SHEATHING LEGEND

BULKHEAD			DECKHEAD		
1	■	16GA. GALV. STL.	A	▨	20GA. GALV. STL.


WATER TIGHT ROOM
SIDE ON DECK SHOE
1
℄
PUMP ROOM
A
1
A
1
A
1
A
1
A
'B'
1
CLEAN LINEN LKR.
SOILED LIN. LKR.
SLOP CHEST
FOAM ROOM
GARBAGE/COMPACTOR ROOM
GYRO ROOM
HOTEL & SUNDRY STORES
T/S
CHANGE ROOM
REFRIGERATED STOREROOM FREEZE 0°
WIREWAY ENCLOSE W/ SHT. METAL
FOR SHEATHING IN REEFER ROOMS SEE REF. #2.
CREW & SHIPS SERVICE LAUNDRY
C.G. LKR.
OFFICER'S MESS ROOM
LOBBY
ELEV.
SERVING AREA
CREW MESS RM.
DRY PROVISION STOREROOM
D.C. LKR.
REFRIGERATED STOREROOM CHILL 35°
FOR SHEATHING IN GALLEY SEE REF #1
GALLEY
SOILED LINEN LKR.
DECK STORES
1
VEST
STAIR TOWER
STAIR TOWER
VEST.
OILSKIN LKR.
DECK W.C.
1
1
A
1

CAMBER DECK

SHIPYARD: N.N.S.D.D.C.	HULL NO. 613, 614 & 615	DWG NO. 7000-111	REV. B
TITLE: SHT. MTL. SHEATHING & DETAILS - CAMBER DECK -		G. HINKLE	SHEET 5

MN15-17X22 (REV. 1)

7000-111

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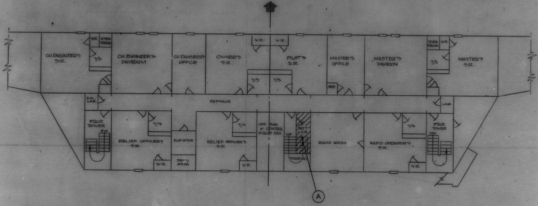
SEPT. '80

6X

SHEATHING LEGEND

BULKHEAD		DECKHEAD	
⬡1	■ 16GA. GALV. STL.	(A)	▨ 20GA. GALV. STL.



W.R.
WIRE TRUNK
CH. ENGINEER'S S.R.
T/S
CH. ENGINEER'S DAYROOM
CH. ENGINEER'S OFFICE
OWNER'S S.R.
W.R.
W.R.
T/S
T/S
PILOT'S S.R.
MASTER'S OFFICE
SAFE
MASTER'S DAYROOM
WIRE TRUNK
W.R.
T/S
MASTER'S S.R.
C.O. LKR.
PASSAGE
LKR.
STAIR TOWER
DN
T/S
RELIEF OFFICER'S S.R.
ELEVATOR
SERV. AREA
W.R.
T/S
RELIEF OFFICER'S S.R.
W.R.
OFF. BAG. & CONTROL EQUIP. RM.
UP
STAIRWAY
BATT. LKR.
RADIO ROOM
T/S
RADIO OPERATOR'S S.R.
W.R.
STAIR TOWER
DN
A

'D' DECK

SHIPYARD: N.N.S.D.D.C.	HULL NO. 613, 614 & 615	DWG NO. 7000-111	REV. 0
TITLE: SHT. MTL. SHEATHING - 'D' DECK -		G. HINKLE	SHEET 6

MN15-17X22 (REV. 1)

MICRO-MASTER 105 mm

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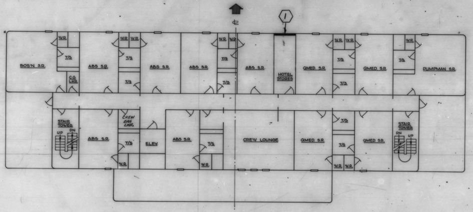
6X

7000-111

SHEATHING LEGEND					
BULKHEAD			DECKHEAD		
⟨1⟩	■	16GA. GALV. STL.	Ⓐ	▨	20GA. GALV. STL.



℄
1
W.R.
W.R.
W.R.
W.R.
W.R.
W.R.
W.R.
W.R.
T/S
T/S
T/S
T/S
T/S
T/S
T/S
BOS'N S.R.
ABS S.R.
ABS S.R.
ABS S.R.
ABS S.R.
C.G. LKR.
HOTEL STORES
QMED. S.R.
QMED. S.R.
PUMPMAN S.R.
STAIR TOWER
UP
DN
ABS S.R.
CREW BAG LKR.
T/S
W.R.
ELEV.
ABS S.R.
T/S
W.R.
CREW LOUNGE
QMED. S.R.
T/S
T/S
W.R.
W.R.
QMED. S.R.
STAIR TOWER
DN
UP

'B' DECK

SHIPYARD NNS.D.D.C.	HULL NO. 613, 614, 615	DWG NO. 7000-111	REV. A
TITLE SHT. METAL SHEATHING B DECK		G. HINKLE	SHEET 7

MN19-17X22 (REV. 1)

7000-111

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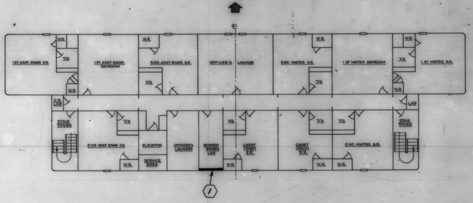
6X

SHEATHING LEGEND					
BULKHEAD			DECKHEAD		
⟨1⟩	▬	16 GA. GALV. STL.	Ⓐ	▨	20 GA. GALV. STL.


℄
1ST. ASST. ENGR. S.R.
W.R.
T/S
W.R.
1ST. ASST. ENGR. DAYROOM
W.R.
3RD ASST. ENGR. S.R.
T/S
OFFICER'S LOUNGE
3RD MATES S.R.
W.R.
T/S
1 ST MATES DAYROOM
W.R.
T/S
W.R.
1 ST MATES S.R.
C.G. LKR
LKR
STAIR TOWER
T/S
2 ND ASST. ENGR. S.R.
W.R.
ELEVATOR
SERVICE AREA
OFFICER'S LAUNDRY
BONDED STORES LKR
T/S
W.R.
CADET (ENG) S.R.
CADET (DECK) S.R.
T/S
W.R.
T/S
W.R.
2 ND MATES S.R.
STAIR TOWER
1

C DECK

SHIPYARD N.N.S.D.D.C.	HULL NO. 613, 614, 615	DWG NO. 7100-111	REV. A
TITLE SHT. MTL. SHEATHING C DECK		G. HINKLE	SHEET 8

MN15-17X22 (REV. 1)

7000 -111

MICRO-MASTER 105 mm

K+E

SEPT. '80

6X

HF-36

REV. STATUS OF SHEETS	REV.	D	C/D	D																					→
	SHEET	1	2/2-A	3	4	5	6	7/7-A	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24 25

REV.	D →					
SHEET	26	27	28	29	30	31 32

PARTIAL ISSUE	☐
COMPLETE ISSUE	✓

GROUP NONE
MC NO. 114

DWG. REV. — HULL APPLIC.

REV.	NN HULLS ONLY 613	614
A	YES	YES
A-1	YES	YES
B	YES	YES
C	YES	YES
D	YES	YES

NNS & DD Co. HULL NO.	MARAD HULL NO.	USMA DESIGN	SHIP'S NAME
614C	310	T11-S-116a	(LATER)
613C	309	T11-S-116a	(LATER)

APPROVALS

OWNERS LTR OF DEC. 7, 1976
ABS
U.S. PUBLIC HEALTH LTR OF JULY 31, 1978
USCG

Newport News Shipbuilding
A Tenneco Company
TENNECO
Commercial Ship Division
FSCM NO. 43689
DESIGN DIVISION DEPT. HULL

REPRODUCTION OFFICE
YARD PRINTS YES GROUPING NO
REMARKS REV. "D" FOR ISSUE
DATE 1-10-79 SIGNED G.D. Harwood

SPECIAL PRINTS

REV.	DATE ISSUED
A	5-4-76
A-1	10-26-76
B	9-28-77
C	8-7-78
D	1-17-79

YARD PRINTS

FIRST ISSUE	DEPT.	NO. PRINTS
10-26-76	X10A	7
	BL	
10-26-76	X10	11
	EL	6
	X11	4
	MI	4
	X14	
	MS	
	MSS	2
	PM	
10-26-76	PS	8
	PT	4
10-26-76	RD	2
	RM	
	MIR	
10-26-76	OA	3
8-7-78	OB	0
	GM	1
	061C	1
	WE	
	WM	
	X16	
10-26-76	LSD	1
	TRD	1

ORDERED BY DESIGN

FIRST ISSUE	DEPT.	NO. PRINTS
5-4-76	CSD:V	1
	OR/SHEL	1
	JDH	1
	RG/EPIA	1
	JDD/CS	1
	EMB	1
10-26-76	K50 (BL)	1
9-28-77	JWH-E13	1

GROUPED BY CHK.
DATES COMP. PART
HULL GROUP NO. KEY

TYPE OF DWG. WORKING DRAWING

SCALE: ______ = 1 Ft.
DRAWN: V.H. HOOD JR.
CHECKED: J.W. BUNTING JR
SECT. MGR. G.D. Harwood
DATE COMPL. 4-16-76
EXAMINED: T.T. Taylor
AUTHORIZED: W.L. for E.E. STEPHENSON
DATE 4-22-76
TECH. APPROVAL
CSD APPROVAL R.L. Harrington

TITLE 390,000 DWT - ULCC
PAINTING SCHEDULE

DWG. NO. 8300-40
REVISION D
SHEET NO. 1 OF 32

M7 11 X 17

8300-40

MICRO-MASTER 105 mm
K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK
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SEPT. '80
4X

REVISIONS

RHW
4-27-76
N.G.

C.G.
10-21-76
N.G.

COST CHG NO. NN	COST CHG NO. OWNER	REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO DATE	NNS&DD CO AUTHD	OWNER DATE	OWNER APPD
—	—	A	–	–	INITIAL ISSUE				
19	Later	A-1	13		1. ON SHT. 13 NOTE "L-HELICOPTER MARKINGS" ADDED TO SUIT N.N. CHG. 19 OWNER CHG. Later				
—	—		11 32 27 27 7 10 7 3 4 12 16	- - 20 21 - - - - - - 33	2. ON SHT. 11 NOTE "J-1" REVISED AND SHT. 32 ADDED. ON SHT. 27 LINES 20 & 21 COATING SYS. ADDED AND ON SHT. 7 NOTE "B-9" REVISED. ON SHT. 10 NOTE "G-4" ADDED AND ON SHT. 7 NOTE "B-7" REVISED. ON SHT. 3 REF. 24, 25 & 26 ADDED. ON SHT. 4 NOTE "A-6" REVISED. ON SHT. 12 NOTE "J-4" ADDED. ON SHT. 16 LINE 33 ADDED. ALL TO SUIT DEVELOPMENT OF PLAN.				
—	—		14 14 14	12 22 5	3. ON SHT. 14 LINE 12 PRODUCT NO. MARKED "LATER" AND BODY OF PLAN REVISED TO SUIT. ON SHT. 14 LINE 22 PRODUCT NO. REVISED FROM "3120" TO "4473" AND BODY OF PLAN REVISED TO SUIT. ON SHT. 14 LINE 5 PRODUCT NO. REVISED FROM "3510" TO "TO SUIT COLOR" AND ON SHT. 27 & 28 FINISH FORMULA MARKED "LATER" TO SUIT. ALL TO SUIT REQUEST OF PAINT MANUFACTURER. JWB JDH 10-6-6	16-11-76			
99	Later	B	4 8 16	- - 6 7	1. ON SHT. 4 NOTE "A.6.(4)." REVISED TO SPECIFY TANKS INVOLVED. ON SHT 8 NOTE "C.4" AND ON SHT. 16 LINE 6, 7, AND 8 REVISED TO SUIT. ALL TO SUIT NN CHG. 99 OWNER CHG. (Later)				
—	—		16 3 4 7-A 8 9 11 12 16 17 18 19 20 21	26 30 32 - - - - - - 21 1 1 1 17 1	2. ON SHT. 16 LINES 26 & 30-32 SURFACE PREP. ADDED AND ON SHT. 3 REF. 27 ADDED. ON SHT. 4 NOTE "A.9" OWNERS REPRES. ADDED. ON ADDED SHT 7A NOTE "B.10" ADDED. ON SHT. 8 NOTE "C.6" ADDED. ON SHT. 9 NOTES "D.2" AND "D.6" REVISED. ON SHT. 11 NOTE "J.1" REVISED. ON SHT. 12 NOTE "J.4" LAST SENTENCE ADDED. ON SHT. 16 LINE 21 LOCATION ADDED. ON SHT. 17 LINES 1, 3-8 & 14; SHT. 18 LINES 1-3 & 9-11; SHT. 19 LINES 1-3; SHT. 20 LINES 17 & 20 AND ON SHT. 21 LINE 1 DECK FINISH MARKED "LATER". ON SHT. 10 NOTE "E.3" ADDED. ALL TO SUIT OWNERS LETTER DATED 12-7-76 TRANS. NO. 1262V.				
—	—	B CONT'D	7 7-A 14 16 27 29 15 27 30	- 12 14 17 18 1 1 - - 24 -	3. ON SHT. 7 NOTE "B.7" LOCATION OF MARK ADDED. ON SHT. 7-A NOTE "B.11" ADDED. ON SHT. 14 LINES 12, AND 14 COATING IDENTIFIED AND LINES 17 AND 18 ADDED AND ON SHT. 16 LINES 1-9; SHT. 27 LINES 1-3 AND 19 AND SHT. 29 REVISED TO SUIT. ON SHT. 15 THINNER NO. REVISED. ON SHT. 27 LINE 24 REVISED TO SUIT TYPE STANCHION. ON SHT. 30 LOCATION OF DIM. ADDED AND LOCATION OF "LLL" REVISED. ON SHT. 17 LINE 2 FINISH CTS. ADDED. ALL TO SUIT DEVELOPMENT OF PLAN. SRK JDH JWB 9-8-7				
—	—	C	9 14	- 33	1. ON SHT. 9 NOTE "D-9" ADDED AND ON SHT. 14 LN 33 & 34 ADDED TO SUIT ADDED REF. 28.				
—	—		4	-	2. ON SHT. 4 NOTE "A-7" REVISED TO SUIT Q.A. REQUEST. DTD. 9-23-77.				
—	—		8	-	3. ON SHT. 8. NOTE "C-4(a)" LAST SENTENCE ADDED TO SUIT LP&S #JDH-4.				
—	—		8	-	4. ON SHT. 8 NOTE "C-7" ADDED TO SUIT LP&S #JDH-5.				
—	—		10	-	5. ON SHT. 10 NOTE "C-1" REVISED AND "C-5" ADDED TO SUIT E-13 REQUEST DTD. 1-12-78.				
—	—		7	-	6. ON SHT. 7 NOTE "B-1" EPOXY PAINT TREAT. ADDED TO SUIT LP&S #JDH-6.				
—	—		27 14	18 3	7. ON SHT. 27 LINE 18 CTG. REVISED FROM "RC" TO "BC" AND ON SHT. 14 LN 3 ADDED TO SUIT LP&S #JDH-7.				
—	—		11 17 32	- 2 6	8. ON SHT. 11 NOTE "J-3", SHT. 17 LN. 2 AND SHT. 32 LN 6 BILGE CTG SYS. REVISED FROM "244 HS" TO "201/230 FD" TO SUIT LP&S #JDH-8.				
—	—		11	-	9. ON SHT. 11 NOTE "J-3" AREAS TO BE PAINTED DEFINED TO SUIT OWNER REQUEST & LP&S #JDH-9.				
—	—		27 28 29 30 14	4 30 - - 4	10. ON SHT. 27 LN 4-7, 9-12, 15-17, 20 AND 24-26 AND ON SHT 28 LN 30 EXTERIOR COLORS ADDED. ON SHT. 29 & 30 REVISED TO SUIT. ON SHT. 14, LN 4, 6, & 8 ADDED. ALL TO SUIT OWNERS COLOR SELECTION				
—	—		27 29	5 -	11. ON SHT. 27 LN 5, 7, 9, 10, 16, 24 & 26 CTG REVISED FROM "CHLOR. RUBBER SYS." TO "EPOXY/ALKYD". SHT. 29 REVISED. ALL TO SUIT LP&S JDH-10.				
—	—		31	-	12. ON SHT. 31 STACK INSIGNIA ADDED TO SUIT OWNER REQUEST.				
					CONT'D ON NEXT SHT.				

PAINTING SCHEDULE	HULL NO. 613C & 614C	DWG. NO. 8300-40	REV. C
	MARAD HULL NO. 309 & 310		SHEET 2

K&E 19 1253 10-71 2236•

MN11-11 X 17 (REV. 1)

8300-40

MICRO-MASTER 105 mm
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SEPT. '80

4X

REVISIONS

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		USN	
NN	OWNER					DATE	AUTHD	DATE	APPD
—	—	C CONT'D	12 7-A - 17 18 19 20 21 22 23 24 26 20 21 23 24 25 26 28 14 - 13 14	- - - 1 3 1 16 1 4 4 5 56 22 10 11 4 14 2 31 9 - - 9	13. ON SHT. 12 NOTE "K-2(e)," REVISED TO SUIT TYPE BATTERIES. ON SHT. 7-A NOTE "B-11" REVISED TO INCLUDE TANKS. ON SHT. 17, LN 1 & 2 BILGE LINE ADDED. ON SHT. 17, LN 1, 3-8, & 14, SHT. 18 LN 1-3 & 9-11, SHT. 19 LN. 1-3, 7 & 9, SHT. 20 LN 16, 17, & 20, SHT. 21 LN 1, 4, & 5, SHT. 22 LN 4 & 5, SHT. 23 LN 4 & 5, SHT 24 LN 5, 6, & 8 & SHT. 26 LN. 56 CTGS FOR DECKS, BHDS & OVHDS COMPLETED. ON SHT 20 LN 22 & 23 AND ON SHT. 21 LN 10 ADDED. ON SHT 23 LN 11 & 12 RELOCATED FROM SHT. 24 LN 4 & 7. ON SHT. 25 LN 14 & 15 RELOCATED FROM SHT. 26 LN 2 & 4. ON SHT. 26 LN 3 & 8 DELETED. ON SHT. 28 LN 31 ADDED. ON SHT. 14 LN 9, 10, 11, 14, 17-20 & 22 REVISED AND LN 26 & 27 ADDED ON SHT. 13 NOTE "L" PAINT FOR HELO. MKG. REVISED. SHOP PRIMER REVISED FROM "DEVRAN 308" TO CARBO-WELD #11, SHT. 14 REVISED TO SUIT. ALL TO SUIT DEVELOPMENT OF PLAN. SRK JWB JDH 7-20-78	7-20-78	D.D.		
142		D	27 14 29	6 6 -	1. ON SHT. 27 LN 6 PRIMER & NON-SKID REVISED FROM "DEVCLOR 3504 & 3508" TO "DEVRAN 201, 201 & 237M". SHT. 29 & SHT. 14 LN 6 REVISED TO SUIT. ALL TO SUIT N.N. CHG. 142 OWNER CHG. (Sater)				
—	—		12 13	- -	2. ON SHT. 12 NOTE "J-5" ADDED AND ON SHT. 13 NOTE L DIM. OFF ℄ REVISED FROM 48'-0 TO 47'-6. ALL TO SUIT DEVELOPMENT OF PLAN. J.B. JDH 1-10-79	1-16-79	D.D.		

COST CHG NO.		REV	SH NO.	LINE No.	DESCRIPTION	NNS&DD CO		USN	
NN	OWNER					DATE	AUTHD	DATE	APPD

PAINTING SCHEDULE	HULL NO. 613C & 614C	DWG. NO. 8300-40	REV. D
	MARAD HULL NO. 309 & 310		SHEET 2-A

K&E 19 1253 10-71 2236•

MN11-11 X 17 (REV. 1)

8300-40

MICRO-MASTER® 105 mm

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SEPT. '80

4X

TABLE OF CONTENTS

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1	TITLE SHEET
2-2-A	REVISIONS
3	TABLE OF CONTENTS & REFERENCES
4-6	NOTES - GENERAL & REQUIRED PAINTING PRACTICES
7	- EXTERIOR
8	- TANKS & VOIDS
9	- INTERIOR
10	- DECKS & WALKING SURFACES
10	- MACHINERY & EQUIPMENT
10	- VENTILATION DUCTS & TRUNKS
11	- ELECTRIC & ELECTRONIC EQUIPMENT
11-12	- PIPING
12-13	- DECK HOUSE UNIT & HELICOPTER MARKINGS
14-15	MATERIAL ABBREVIATIONS
16	INTERIOR - TANKS & VOIDS
17	- HOLD DK, 33' & 60' FLAT
18	- SECOND DK & 78'-4 FLAT
19-20	- UPPER & CAMBER DK
21	- "A" DK
22	- "B" DK
23	- "C" DK
24-25	- "D" DK
26	- NAV BRIDGE DK
27-29	EXTERIOR
30	EXTERIOR PROFILE & EXTERIOR COLORS
31	EXTERIOR INSIGNIAS
32	PIPING INFO.

REFERENCES

	NO.	TITLE	DWG NO.
	1	DK COVERING OUTSIDE OF DK HOUSE	5500-101
	2	DK COVERING ARR & DET DK HOUSE	5500-102
	3	CARPET ARR DK HOUSE	5500-103
	4	COLOR SCHEDULE	5050-27
	5	JOINER ARR "CAMBER DK"	5200-61
	6	"A DK"	5200-62
	7	"B DK"	5200-63
	8	"C DK"	5200-64
	9	"D DK"	5200-65
	10	"NAV BRIDGE DK"	5200-67
	11	CEILING ARR "CAMBER DK"	5200-68
	12	"A DK"	5200-69
	13	"B DK"	5200-70
	14	"C DK"	5200-71
	15	"D DK"	5200-72
	16	"NAV BRIDGE DK"	5200-74
	17	TOILETS & SHOWERS ARR & DET	5200-76
	18	SHEET METAL SHEATHING ARR DK HOUSE	7000-111
	19	LIST OF BHD & TK TEST INFO	1430-68
	20	ELEMENTARY & ISOMETRIC WIRING DIAGRAM CATHODIC PROTECTION SYSTEM	4100-2100
	21	INSULATION & SHEATHING OUTSIDE DK HOUSE ARR & DETS	7000-104
	22	REFRIG SHIPS STORES CAMBER DK FR 53-58	5450-141
	23	ARRANGEMENTS OF ACCOMMODATIONS	268576
A-1	24	(MERCHANT STD) STANDARD PIPE HANGERS AND INSTALLATION INSTRUCTIONS	257056
	25	SHIPS NAME, HAILING PORT AND DRAFT MARK LOCATION	1800-76
	26	STACK INSIGNIA LOCATION	1800-75
B	27	NON-STRUCTURAL TANKS- ASSEMBLY	6150-175
	28	THERMAL INSULATION ARRANGEMENT	7000-104
C1			

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	MARAD HULL NO. 309 & 310		SHEET 3

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A. GENERAL NOTES AND REQUIRED PAINTING PRACTICES:

1. WORKMANSHIP:

CARE SHOULD BE TAKEN TO INSURE THAT THE SURFACE AFTER PAINTING SHALL BE OF THE BEST OBTAINABLE SMOOTHNESS CONSISTANT WITH THE PLATE SURFACE ROUGHNESS TO WHICH APPLIED. THE APPLICATION OF FINISHES SHALL BE OF THE HIGHEST QUALITY WORKMANSHIP.

2. SAFETY PRECAUTIONS:

SUITABLE SAFETY PRECAUTIONS SHALL BE TAKEN DURING SURFACE PREPARATION, CLEANING AND PAINTING OPERATIONS.

3. MIXING OF MATERIAL, APPLICATION AND DRYING TIME:

MIXING OF MATERIAL, APPLICATION, AND DRYING TIME BETWEEN COATS MUST BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS SUPPLEMENTED BY THIS PLAN, WITH THIS PLAN PREVAILING IN CASES OF CONFLICT.

4. AIR TEMPERATURE, HUMIDITY, DEW-POINT, AND METAL TEMPERATURE:

AIR TEMPERATURE, HUMIDITY, DEW-POINT TEMPERATURE AND METAL TEMPERATURE SHOULD BE DETERMINED AND RECORDED FOR ALL OUTSIDE HULL PAINT JOBS EXCEPT APPLICATION OF DEVRAN 308, BOTH ON PLATENS AND IN DRY DOCK. INSTRUMENTS FOR THIS PURPOSE ARE AVAILABLE IN THE YARD. WHENEVER DEW POINT OR NEAR DEW POINT CONDITIONS PREVAIL, PAINTING SHOULD BE DEFERRED UNTIL THE METAL IS BROUGHT TO ABOVE DEW POINT EITHER BY WARMING THE METAL OR BY ATMOSPHERIC CHANGES.

5. PAINT FILM THICKNESS:

WHERE PAINT FILM THICKNESS IS NOT SPECIFIED, PAINT MANUFACTURERS RECOMMENDATIONS ARE TO BE FOLLOWED.

6. STEEL WORK PRIOR TO FABRICATION:

(A-1) ALL STEEL WORK SHALL BE SCALED BY ABRASIVE BLASTING PRIOR TO FABRICATION AND GIVEN ONE COAT OF INORGANIC ZINC PRE-CONSTRUCTION PRIMER, DEVRAN 308, (THINNED 100%), EXCEPT SURFACES IN THE FOLLOWING LOCATIONS WHICH ARE NOT TO BE PRIMED:
(1) POTABLE AND DISTILLED WATER TANKS.
(2) NOT USED
(3) LUBE OIL TANKS

(B) NOTE: SURFACES OF CARGO OIL TANKS ARE NOT REQUIRED TO BE PRIMED, HOWEVER PRIMER MAY BE APPLIED WHERE NECESSARY TO REDUCE CORROSION DURING CONSTRUCTION.

THE PLATES ARE TO BE DRY AND ABOVE DEW POINT WHEN PAINTED. THE PAINT IS TO BE SPOT CHECKED WITH A MAGNETIC TYPE FILM THICKNESS GAUGE AND IS TO BE BETWEEN 3/4 AND 1 MIL (18 TO 25 MICRONS) IN DRY FILM THICKNESS.

7. COLOR CODES OF PRE-CONSTRUCTION PRIMER:

(C_2) STEEL TO BE COATED WITH PRE-CONSTUCTION PRIMER (DEVRAN 308) SHALL BE COLOR CODED IN ACCORDANCE WITH THE PUBLISHED N.N. FORM NO.2331-1. ~~WHERE MARKINGS ON THE PRE-CONSTRUCTION PRIMER OR SUBSEQUENT COATS ARE REQUIRED, N.N. E-1 EPOXY MARKING PAINT SHALL BE USED IN COLORS AS SPECIFIED IN N.N. PROCEDURE CSQ-1, PARA 3.b~~.

8. THINNING OF MATERIAL:

ALL PAINTS AND COATINGS SHALL BE APPLIED AS RECEIVED FROM THE MANUFACTURER AND ARE NOT TO BE THINNED OR ALTERED IN ANY WAY, UNLESS OTHERWISE SPECIFIED BY THE MANUFACTURER.

9. PAINT MANUFACTURER'S REPRESENTATIVE:

THE PAINT MANUFACTURER SHALL PROVIDE COMPREHENSIVE SUPERVISION OF ALL SURFACE PREPARATION AND APPLICATION INCLUDING WORK DONE BY SUB-CONTRACTORS AS FAR AS PRACTICAL. THE PAINT MANUFACTURER'S REPRESENTATIVE SHALL BE NOTIFIED AS FAR IN ADVANCE AS POSSIBLE PRIOR TO THE COMMENCING OF PAINT WORK. IN NO INSTANCE SHALL THE PAINT MANUFACTURER'S REPRESENTATIVE'S ABSENCE AFTER PROPER NOTIFICATION DELAY THE SCHEDULED WORK.

OWNERS REPRESENTATIVE:

(B) THE OWNERS REPRESENTIVE SHALL BE NOTIFIED PRIOR TO THE APPLICATION OF THE TOUCH-UP COAT AND BEFORE EACH SUBSEQUENT COAT OF A PAINT SYSTEM, AND FINALLY AFTER THE FINISHED COAT IS APPLIED. NOTIFICATION FOR MINOR TOUCH-UP PAINTING OF CONSTRUCTION DAMAGE IS EXCLUDED.

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10. SURFACE PREPARATION-STEEL COATED WITH PRE-CONSTRUCTION PRIMER:

a) SURFACES TO BE PAINTED SHALL BE FREE OF RUST, MILL SCALE, DIRT, OIL, GREASE, DETERIORATED PAINT AND OTHER SURFACE CONTAMINANTS. CLEANING SHALL PRECEDE COATING BY THE SHORTEST PRACTICAL INTERVAL.

b) PRIOR TO THE APPLICATION OF A SPECIFIED COATING THE INTACT PRE-CONSTRUCTION PRIMER IS TO BE CLEANED WITH FRESH WATER TO REMOVE ACCUMULATED SALTS WHERE REQUIRED.

c) UNLESS OTHERWISE SPECIFIED, ALL DAMAGED AREAS OF STEEL COATED WITH PRE-CONSTRUCTION PRIMER INCLUDING ERECTION WELDS ARE TO BE MECHANICALLY CLEANED. CARE IS TO BE TAKEN TO PROVIDE A SUITABLE PROFILE FOR SUBSEQUENT COATINGS.

11. SURFACE PREPARATION-DAMAGE TO SUBSEQUENT COATING SYSTEMS:

AREAS OF SUBSEQUENT COATING DAMAGE ARE TO BE MECHANICAL CLEANED WITH THE EDGES OF INTACT COATING SYSTEM WELL FEATHERED.

12. SURFACES PREPARATION-ALUMINUM:

ALUMINUM SURFACES SUBJECT TO COATING SHALL BE CLEANED OF GREASE AND OTHER SURFACE CONTAMINANTS AND TREATED WITH DE-OXIDINE OR EQUAL.

13. SURFACE PREPARATION-GALVANIZED:

GALVANIZED SURFACES SUBJECT TO COATING SHALL BE TREATED BY ONE OF FOLLOWING APPLICABLE METHODS:

1) EXTERIOR SHIP SURFACES-REMOVE SURFACE CONTAMINANTS AND APPLY ONE COAT OF WASH COAT PRIMER.

2) INTERIOR SHIP SURFACES-REMOVE SURFACE CONTAMINANTS AND CHEMICALLY CLEAN WITH LITHOFORM NO.2.

14. SURFACE PREPARATION-OTHER:

SURFACES OTHER THAN METAL SHALL BE CLEANED AND SMOOTHED. SURFACES INTENDED TO BE LEFT UNPAINTED, SUCH AS PLATED METAL FIXTURES, HARDWARE, DECK COVERING, GLASS, ETC., WILL BE CAREFULLY MASKED AND PROTECTED DURING BLASTING AND COATING. ANY COATING MATERIALS WHICH MAY ACCUMULATE ON SUCH SURFACES SHALL BE REMOVED.

15. TOUCH-UP PAINTING AFTER SUB-ASSEMBLY AND/OR ERECTION:

a) UNLESS OTHERWISE SPECIFIED, ALL DAMAGE TO PRE-CONSTRUCTION PRIMER SHALL BE CLEANED IN ACCORDANCE WITH NOTE 10 AND ONE TOUCH-UP COAT OF ZINC RICH PRIMER (DEVRAN 302) IS TO BE APPLIED BETWEEN 2.0 AND 3.0 MILS (50 TO 75 MICRONS) TO THE CLEANED SURFACES PRIOR TO APPLICATION OF THE SPECIFIED COATING SYSTEM. WHERE DAMAGED AREAS ARE TO BE ABRASIVE BLASTED, THE DEVRAN 308 MAY BE REAPPLIED IN LIEU OF THE ZINC RICH PRIMER. SEE NOTE "B-5" AND "C-7"

b) UNLESS OTHERWISE SPECIFIED, AREAS OF SUBSEQUENT COATING DAMAGE ARE TO BE REPAIRED IN ACCORDANCE WITH NOTE 11 AS REQUIRED FOR THE SPECIFIC AREA AND ONE COAT OF TOUCH-UP COAT OF ZINC RICH PRIMER (DEVRAN 302) IS TO BE APPLIED BETWEEN 2.0 AND 3.0 MILS (50 TO 75 MICRONS) PRIOR TO THE SYSTEM BEING RESTORED TO THE MINIMUM SPECIFIED DRY FILM THICKNESS.

c) PRIOR TO IMMERSION FOR HYDROSTATIC TESTING AT NEWPORT NEWS, ALL BARE OR DAMAGED AREAS EXCEPT WELDS ARE TO BE PREPARED AND COATED. ALL WELDS IN THE BOUNDARY OF SPACES TO BE TESTED SHALL BE PREPARED AND COATED IN A ACCORDANCE WITH REF 19.

16. ITEMS NOT TO BE PAINTED:

THE FOLLOWING IS A LIST OF ITEMS NOT TO BE PAINTED AND SHALL BE PROPERLY PROTECTED BY CAREFUL MASKING OR TEMPORARY COVERING. ANY COATING MATERIALS WHICH MAY ACCUMULATE ON SUCH ITEMS OR SURFACES SHALL BE REMOVED.

PRE-FINISHED PANELS, BAKED ON FINISHES
CANVAS WORK, STAINLESS STEEL
HARDWARE, NAME PLATES
GASKETS
PACKINGS
WORKING PARTS OF DOORS, HATCHES, AIRPORTS, ETC.
THREADS, VALVE STEMS
DECK COVERING
PROPELLER
GLASS LENSES OF AIRPORTS, FIXED LIGHTS, ETC.
POLISHED STEEL RAILS
MACHINERY WORKING PARTS

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17. TREATMENT OF DAMAGE TO GALVANIZED SURFACES NOT TO BE PAINTED:

DAMAGE TO GALVANIZED SURFACES NOT TO BE PAINTED SHALL BE CLEANED AND COATED WITH ONE COAT OF GALVANIZING REPAIR PAINT ("GRC" OR EQUAL).

18. FAYING SURFACES OF ALUMINUM TO DISSIMILAR METALS:

a) EXPOSED TO THE WEATHER OR HIGH HUMIDITY SHALL BE COATED WITH TWO COATS OF DEVRAN 4473.

b) IN DRY SPACES SHALL BE COATED WITH ONE COAT OF DEVRAN 4473.

19. MECHANICAL CLEANING:

MECHANICAL CLEANING, AS USED THROUGHOUT THIS PLAN, IS TO BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AS TO THE TYPE OF MACHINES (DISCSANDERS, WIRE BRUSHES, NEEDLE GUNS, ETC.) AND ACCESSORIES (PADS, WIRE SIZES, ETC.) THAT CAN BE USED WHERE PRACTICABLE.

20. FINISH FOR PARTS OR ITEMS NOT SPECIFICALLY MENTIONED:

PARTS OR ITEMS NOT SPECIFICALLY MENTIONED HEREIN SHALL BE FINISHED TO CONFORM TO THE SURROUNDING STRUCTURE. SEE NOTE 24.

21. INACCESSIBLE AREAS THAT REQUIRE CEMENT:

CERTAIN INACCESSIBLE AREAS SHALL BE CEMENTED TO INSURE A FREE FLOW OF WATER TO THE DRAINAGE CONNECTION.

22. TREATMENT OF WOOD SURFACES:

a) WOOD TO BE PAINTED SHALL BE TREATED WITH WOOD PRESERVATIVE AFTER WHICH IT SHALL BE GIVEN TWO COATS OF PRIMER AND A COLOR COAT OF FIRE RETARDANT PAINT.

b) WOOD NOT TO BE PAINTED SHALL BE COATED WITH FOUR (4) COATS OF POLYURETHANE VARNISH WITH SURFACE SANDED BETWEEN COATS.

23 VENDOR PAINTED ITEMS:

ITEMS PAINTED BY VENDOR WITH PAINTS AND COATINGS OTHER THAN SPECIFIED IN THIS PLAN SHOULD BE COMPATIBLE WITH THE COATING SYSTEMS SPECIFIED IN THIS PLAN.

24. SPACES NOT SPECIFICALLY MENTIONED:

SPACES NOT OTHERWISE MENTIONED SHALL NOT HAVE ANY COATING SYSTEM, OTHER THAN PRE-CONSTRUCTION PRIMER, APPLIED.

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B. EXTERIOR NOTES:

1. IN WAY OF KEEL BLOCKS:

(C6) THE UNDERSIDE OF THE FLAT PLATE KEEL IN WAY OF THE KEEL BLOCKS SHALL BE PAINTED WITH THE COMPLETE UNDERWATER SYSTEM AS INDICATED ON SHEET 27 LINE 1 BEFORE LAYING ON THE KEEL BLOCKS. THE AREAS IN WAY OF THE BLOCKS SHALL BE PROTECTED BY MEANS OF ALUMINUM FOIL OR BY HEAVY OILED PAPER OR BY PAINTING THE BLOCKS WITH EPOXY PAINT.

2. TREATMENT OF MISCELLANEOUS EXTERIOR AREAS THAT REQUIRED PAINTING:

THE EXTERIOR SURFACES OF FITTINGS, HANGERS, CLIPS, ETC. ABOVE UPPER DECK SHALL BE COATED IN THE SAME MANNER AS THEIR SURROUNDINGS.

3. APPLICATION OF ANTI-FOULING PAINT:

THE ANTI-FOULING PAINT SHALL BE APPLIED WITHIN THE TIME LIMIT RECOMMENDED BY THE PAINT MANUFACTURER PRIOR TO RENDERING THE SHIP WATERBORNE, EXCEPT FOR THE AREAS MENTIONED IN NOTE 1.

4. DIELECTRIC SHIELD:

THE PAINTS SPECIFIED ON LINE 29 SH 28 SHALL BE APPLIED AS SOON AS PRACTICAL AFTER APPLICATION OF THE DIELECTRIC SHIELD (SEE REF 20 FOR BLASTING AND APPLICATION OF SHIELD MATERIAL). ANODES SHALL NOT BE COATED AND SHALL BE MASKED OR OTHERWISE PROTECTED DURING PAINTING OR ABRASIVE BLASTING.

5. TOUCH-UP UNDERWATER HULL AFTER FABRICATION:

DAMAGE AND NECESSARY REPAIRS TO THE PRE-CONSTRUCTION PRIMER ON THE UNDERWATER HULL SHALL BE ACCOMPLISHED BY CLEANING IN ACCORDANCE WITH NOTE "A-10" AND APPLYING A TOUCH-UP COAT OF DEVRAN 201 AT 2 TO 3 MILS (50 TO 75 MICRONS). DEVRAN 302 ZINC RICH PRIMER IS NOT TO BE APPLIED TO THE UNDERWATER HULL.

6. DRY-DOCKING AFTER LAUNCHING:

IF THE VESSEL IS DOCKED AFTER LAUNCHING AND THE PAINT FOUND TO HAVE DETERIORATED OR TO BE DAMAGED, THEN THE AREA SHALL BE TREATED AS INDICATED IN NOTE 5 AND A-15.

7. HULL MARKINGS:

(A1) DRAFT MARKS, ETC. SHALL BE OUTLINED IN WELD BEAD AND PAINTED WHITE. A LINE 6 INCHES ABOVE THE LIGHTLOAD LINE SHALL BE MARKED BY AN INTERMITTENT WELD BEAD AROUND THE HULL TO LOCATE LINE OF COATING SEPARATION IN ACCORDANCE WITH REF. 25. ALL EXTERIOR HULL MARKINGS (B) ARE INDICATED ON REF. 25.

8. INTERIOR OF RUDDER:

THE RUDDER SHALL BE PRESERVED INTERNALLY WITH A RUST PREVENTATIVE COMPOUND.

9. ANCHOR CHAIN MARKINGS:

(A-1) MARKINGS FOR THE ANCHOR CHAIN WILL BE AS FOLLOWS AND CONSISTS OF ONE COAT DEVRAN CHLORINATED RUBBER FINISH PAINT OF THE APPLICABLE COLOR TO THE LINKS NOTED.

FIRST SHOT FROM ANCHOR:
ONE WHITE LINK
↓ RED ↓
WHITE

SECOND SHOT FROM ANCHOR:
ONE WHITE LINK
↓ YELLOW ↓
WHITE

THIRD SHOT FROM ANCHOR:
ONE WHITE LINK
↓ GREEN ↓
WHITE

FOURTH SHOT FROM ANCHOR:
THREE WHITE LINKS

THIRD SHOT FROM BITTER END:
ONE WHITE LINK
THREE GREEN LINKS
ONE WHITE LINK

SECOND SHOT FROM BITTER END:
ONE WHITE LINK
THREE YELLOW LINKS
ONE WHITE LINK

FIRST SHOT FROM BITTER END:
ONE WHITE LINK
THREE RED LINKS
ONE WHITE LINK

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Ⓑ 10. DECK EDGE MARKING:

THE TOPSIDE AREA SHALL BE CARRIED AROUND THE GUNWALE TO THE FIRST WELDED SEAM APPROXIMATELY 31-1/2 INBOARD OF THE SIDE SHELL, OUT WITH THE GUNWALE AREA IN WAY OF THE COAMING, THE LINE SHOULD STOP AT THE TOP OF THE COAMING.

Ⓑ (C13) 11. WINTER / SUMMER EPOXY COATING:

THE MANUFACTURERS REPRESENTATIVE AT HIS DISCRETION MAY AUTHORIZE THE USE OF DEVRAN 230 IN LIEU OF DEVRAN 230 FD ON THE EXTERIOR HULL BELOW THE WATERLINE & TANKS FOR THE EXPRESSED PURPOSE OF CONTROLLING THE DRYING PROPERTIES OF THE COATING (CONCURRENCE OF NEWPORT NEWS IS REQUIRED.)

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C. TANKS AND VOIDS:

1. **POTABLE WATER, DISTILLED WATER, AND LUBE OIL TANKS:**

INTERIOR SURFACES OF POTABLE WATER, DISTILLED WATER AND LUBE OIL TANKS (NOT PREVIOUSLY PRIMED) ARE TO ABRASIVE BLASTED PRIOR TO APPLICATION OF SPECIFIED COATING SYSTEM.

2. **FUEL OIL TANKS:**

FUEL OIL TANKS SHALL NOT BE COATED, HOWEVER, ANY INTACT DEVRAN 308 PRIMER THAT REMAINS AFTER ERECTION NEED NOT BE REMOVED.

3. **COFFERDAMS AND VOIDS:**

COFFERDAMS AND VOIDS SHALL NOT RECEIVE ADDITIONAL COATING AFTER ERECTION TOUCH-UP.

Ⓑ 4. **CARGO TANKS:**

(C$_3$) (a) TOP OF CARGO OIL TANKS, ℄ NOS. 2-C, 3-C, 5-C, 6-C, 7-C AND WING NOS. 7 & 9 P/S, AND ALL STRUCTURE (INCLUDING PIPING) TO A POINT 6 FT. BELOW AND PARALLEL TO THE UNDERSIDE OF THE DECK SHALL RECEIVE THE COATING SYSTEM ON SHT. 16 LINES 6 & 7. SURFACE PREPARATION & PAINTING MAY EXTEND BEYOND THE 6 FT. POINT AS NECESSARY TO SUIT CONSTRUCTION REQUIREMENTS.

(b) WING TANKS NO. 12 P/S SHALL RECEIVE THE COATING SYSTEM INDICATED ON SHT. 16 LINE 8 ON ALL STRUCTURE AND PIPING.

(c) ALL OTHER CARGO OIL TANK STRUCTURE (INCLUDING PIPING) OUTSIDE THE PAINTED AREAS SHALL NOT BE COATED AND DOES NOT REQUIRE CLEANING OF CORROSION PRODUCTS PRIOR TO DELIVERY.

5. **CHAIN LOCKERS AND CHAIN LOCKER SUMPS:**

INTERIORS OF CHAIN LOCKERS AND CHAIN LOCKER SUMPS INCLUDING ALL STRUCTURE SHALL BE CLEANED IN ACCORDANCE WITH NOTE "A-10" AND THE COATED AS INDICATED IN SHEET 16 LINES 10 AND 11.

6. **SAND BOX:**

Ⓑ SAND BOX SHALL BE FINISH PAINTED RED WITH WHITE LETTERING.

7. **ABRASIVE BLASTING OF TANKS**

(C$_4$) AREAS OF TANKS WHICH ARE ABRASIVE BLASTED AFTER SUB-ASSEMBLY AND/OR ERECTION AND ARE COATED IMMEDIATELY AFTER SURFACE PREPARATION WITH THE REGULAR COATING SYSTEM (DEVRAN 201/230 OR 230 FD), DO NOT REQUIRE THE TOUCH-UP COAT OF ZINC-RICH PRIMER, DEVRAN 302. A VACUUM BLAST UNIT MUST BE USED WHERE ERECTION WELDS ARE TO BE ABRASIVE BLASTED IN ORDER TO PREVENT CONTAMINATION OF SURROUNDING COATED AREA.

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D. INTERIOR NOTES:

1. TREATMENT OF STEEL SURFACES BEHIND REFRIGERATED STORES INSULATION:

THE STEEL BEHIND REFRIGERATED STORES INSULATION SHALL BE GIVEN TWO COATS OF AN ASPHALT EMULSION, FLINTKOTE HYDRAULT OR EQUAL.

2. TREATMENT OF STEEL SURFACES BEHIND INSULATION:

Ⓑ STEEL SURFACES BEHIND INSULATION SHALL BE PAINTED WITH ONE COAT OF DEVRAN 308. A TOUCH-UP COAT OF DEVRAN 302 AND FULL COAT OF DEVRAN 4473. ~~WHERE SOLVENT-TYPE ADHESIVES ARE USED TO SECURE THE INSULATION, THE COAT OF DEVRAN 4473 MAY BE DELETED~~.

3. TREATMENT OF STAINLESS STEEL SURFACES:

PAINT IS NOT TO BE APPLIED TO SURFACES OF STAINLESS STEEL IN INTERIOR SPACES.

4. JOINER BULKHEADS:

NO PAINT IS REQUIRED ON JOINER BULKHEADS, EXCEPT H-POSTS AND CORNER POSTS, WHICH SHALL HAVE A BAKED ENAMEL FINISH TO BLEND WITH THE BULKHEAD AND CEILING FINISH.

5. BATTERY ROOM:

THE INTERIOR OF THE BATTERY ROOM IS TO BE COATED WITH ACID-RESISTING PAINT AS INDICATED ON SHEET 26 LINE 4.

6. TREATMENT OF STEEL SURFACES BEHIND BULKHEAD SHEATHING, DECORATIVE COVERINGS AND SUSPENDED CEILINGS:

Ⓑ STEEL SURFACES BEHIND BULKHEAD SHEATHING, DECORATIVE COVERINGS AND SUSPENDED CEILINGS SHALL BE PAINTED WITH ONE COAT OF DEVRAN 308. A TOUCH-UP COAT (TO ANY DAMAGED AREAS) OF DEVRAN 302 AND A FULL COAT OF DEVRAN MD 4473, UNLESS OTHERWISE SPECIFIED. ~~WHERE SOLVENT-TYPE ADHESIVES ARE USED TO SECURE BULKHEAD SHEATHING OR DECORATIVE COVERINGS, THE COAT OF DEVRAN 4473 MAY BE DELETED~~. PIPING AND OTHER SURFACES IN THIS AREA WHICH HAVE BEEN GALVANIZED OR OTHERWISE COATED SHALL NOT REQUIRE ANY ADDITIONAL PAINT OTHER THAN TOUCH-UP OF INSTALLATION DAMAGE.

7. TREATMENT OF STEEL, ALUMINUM, AND GALVANIZED SURFACES OF STOREROOM BINS, RACKS, SHELVING AND MISC FITTINGS:

ALL STOREROOM BINS, RACKS, SHELVING AND MISC FITTINGS MADE OF STEEL WILL BE PAINTED WITH ONE COAT OF DEVRAN 4473 AND ONE COAT OF N.N. FINISH COLOR TO MATCH SURROUNDING STRUCTURE, OVER DEVRAN 308 TOUCHED-UP WITH DEVRAN 302. FOR ALUMINUM SURFACES APPLY ONE COAT OF DEVRAN FORMULA 117, ONE COAT OF DEVRAN 4473 AND ONE COAT OF N.N. FINISH COLOR TO MATCH SURROUNDING STRUCTURE. FOR GALVANIZED SURFACES, SEE NOTE "A-13" AND "A-17" AND PAINT SAME AS REQUIRED FOR ALUMINUM SURFACES. (THIS NOTE IS NOT APPLICABLE TO ITEMS SPECIFIED TO RECEIVE A BAKED FINISH)

8. EXPANDED METAL BULKHEADS:

EXPANDED METAL BULKHEADS SHALL BE COATED WITH TWO COATS OF DEVRAN 4473 AND TWO COATS OF N.N. CHLORINATED ALKYD FINISH, COLOR TO MATCH SURROUNDINGS.

9. TREATMENT OF EXPOSED HULL INSULATION IN ENGINE ROOM:

(C_1) ALL EXPOSED HULL INSULATION IN THE ENGINE ROOM (SEE REF. 28) SHALL BE COATED WITH ONE COAT OF MOBIL 13-R-10 PRIMER AND ONE COAT OF MOBIL 98-W-10 FINISH (WHITE) TO PREVENT OIL PENETRATION. ALLOW A MINIMUM OF 16 HOURS DRYING TIME BETWEEN COATS.

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E. DECKS AND WALKING SURFACES:

1. AREAS REQUIRING INSTALLATION OF DECK COVERINGS:

PRIOR TO THE INSTALLATION OF DECK COVERINGS, INTERIOR STEEL DECKS SHALL BE DRY, FREE OF RUST, SCALE, DIRT, OR OTHER FOREIGN MATTER. CLEAN INTACT DEVRAN 308 PRIMER NEED NOT BE REMOVED.

2. NON-SKID DECK COVERING:

NON-SKID COVERING SHALL NOT BE APPLIED TO INTERIOR DECKS, UNLESS OTHERWISE SPECIFIED HEREIN.

3. MISC. AREAS:

THE AREA INSIDE COAMING BARS OF STEERING GEAR AND AFTER MACHINERY TO BE PAINTED BLACK WITH FOUNDATION PAINTED THE SAME COLOR AS SURROUNDING AREA.

F. MACHINERY AND EQUIPMENT NOTES:

1. MACHINERY AND EQUIPMENT PRIMER COATS: (BY VENDORS)

MACHINERY AND EQUIPMENT SHOULD BE PAINTED WITH PRIMER COATS BY VENDOR AS REQUIRED BY INDIVIDUAL PURCHASE SPECIFICATIONS. SEE NOTE "A-23".

2. EXTERIOR MACHINERY AND EQUIPMENT:

ALL EXTERIOR MACHINERY SHALL BE COATED AS INDICATED ON SHEET 27 LINE 12.

3. INTERIOR MACHINERY AND EQUIPMENT:

ALL INTERIOR MACHINERY SHALL HAVE ANY DAMAGE TO THE PRIMER TOUCHED-UP WITH DEVRAN 4473 AND APPLY, ONE FULL COAT OF DEVRAN 4473 AND ONE COAT OF N.N. FINISH (COLOR LATER). WHERE PRACTICAL, MACHINERY AND EQUIPMENT LOCATED IN THE BILGE REGION SHALL RECEIVE THE SAME COATING SYSTEM AS SPECIFIED FOR THE BILGE.

G. VENTILATION DUCTS AND TRUNKS:

1. INTERNAL SURFACES

(C_5) INTERNAL SURFACES OF NON-GALVANIZED DUCT OR TRUNKS SHALL BE GIVEN ONE COAT OF INORGANIC ZINC PRE-CONSTRUCTION PRIMER, DEVRAN 308. EXISTING CLEAN AND INTACT PRIMER IS CONSIDERED TO HAVE MET THIS REQUIREMENT. PRIMER DAMAGED BY WELDING DURING FABRICATION OR INSTALLATION SHALL BE TOUCHED UP WHERE ACCESS PERMITS.

2. EXTERNAL SURFACES NOT REQUIRING INSULATION:

EXTERNAL SURFACES OF ALL UNINSULATED DUCTS SHALL BE PAINTED THE SAME AS SURROUNDING STRUCTURE.

3. EXTERNAL SURFACES REQUIRING INSULATION

(a) EXTERNAL SURFACES OF DUCTS AND TRUNKS TO BE INSULATED SHALL REQUIRE PAINTING AS INDICATED IN NOTE "D-2".

(b) PAINT INSULATION THE SAME AS SURROUNDING STRUCTURE

4. GALVANIZED SURFACES:

(A_1) GALVANIZED SURFACES SHALL BE TREATED AS INDICATED IN NOTES "A-13" AND "A-17" AS APPLICABLE.

5. EXHAUST DUCTS AND TRUNKS

(C_5) THE INTERIOR OF EXHAUST DUCTS AND TRUNKS SERVING BATTERY LOCKERS OR ROOMS SHALL BE PAINTED WITH ALKALI-RESISTANT PAINT. THE EXTERIOR SHALL BE PAINTED IN ACCORDANCE WITH NOTES G-2 AND G-3 AS APPLICABLE.

PAINTING SCHEDULE GENERAL NOTES	HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 10	REV D

N.N. FORM N18-22

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H. ELECTRIC AND ELECTRONIC EQUIPMENT:

1. ELECTRIC AND ELECTRONIC EQUIPMENT SHALL BE PAINTED AS FOLLOWS:

(a) EQUIPMENT RECEIVED IN AN UNPAINTED CONDITION SHALL BE PAINTED WITH ONE COAT OF DEVOE FORMULA 117, ONE COAT OF DEVRAN 4473 AND ONE COAT ON N.N. EQUIPMENT GRAY, FORMULA 111.

(b) EQUIPMENT RECEIVED WITH DAMAGED AREAS SHALL BE RECOATED AS REQUIRED USING PAINTS INDICATED IN NOTE (a)..

(c) BEFORE INSTALLATION OF FRONT SERVICED ELECTRIC AND INTERIOR COMMUNICATION EQUIPMENT, THE BULKHEAD AND DECK AREA SHALL BE PAINTED THE SAME AS SURROUNDING STRUCTURE, EXCEPT FINISH COATS NEED NOT BE APPLIED.

(d) SUPPORT STRUCTURE FOR CABLE SHALL BE PRIMED BEFORE INSTALLATION OF CABLE. AFTER BEING SECURED IN POSITION, ALL THE SUPPORT STRUCTURE AND ANY ARMORED CABLE EXPOSED TO VIEW SHALL HAVE FINISH COATS TO MATCH SURROUNDING STRUCTURE APPLIED.

(e) EQUIPMENT GROUND CONTACT POINTS, EXCEPT FOR FINISHED GROUND CONNECTIONS EXPOSED TO THE WEATHER, AND CERAMIC INSULATORS SHALL NOT BE PAINTED AND SHALL BE PROTECTED AGAINST SPATTERING.

J. PIPING:

1. EXTERNAL SURFACES (INTERIOR SHIP):

(A-1) (B) (a) PIPES AND PIPE COMPONENTS IN ~~CARGO OIL TANKS, SLOP TANKS~~, FUEL OIL TANKS AND LUBE OIL TANKS ARE NOT TO BE PAINTED, EXCEPT THAT INTACT PRE-CONSTRUCTION PRIMER NEED NOT BE REMOVED.

(b) STEEL PIPES AND PIPE COMPONENTS IN DISTILLED AND POTABLE WATER TANKS ARE TO BE PAINTED THE SAME AS THE TANK STRUCTURE.

(B) (c) PIPES IN CLEAN S.W. BALLAST TANKS AND SLOP TANKS ARE TO BE PAINTED THE SAME AS SURROUNDING AREA.

(d) GALVANIZED PIPE SHALL BE GIVEN ONE COAT OF WASH PRIMER OR BE CHEMICALLY CLEANED AND SHALL RECEIVE ONE FINISH COAT TO MATCH SURROUNDING AREA.

(e) NON-FERROUS PIPING AND COMPONENTS NEED NOT BE PAINTED.

(f) PIPE LAGGING SHALL RECEIVE TWO COATS OF FINISH PAINT, HEAT RESISTING TYPE WHERE NECESSARY, SAME COLOR AS SURROUNDING AREAS.

(g) FOR ADDITIONAL PIPE COATING INFORMATION, SEE SHT 32.

(B) (h) FOR TREATMENT OF PIPES IN CARGO OIL TANKS-SEE NOTE C-4.

2. EXTERNAL SURFACES (EXTERIOR SHIP):

(a) EXTERNAL SURFACES SHALL BE PAINTED IN ACCORDANCE WITH THE APPLICABLE PART OF SHT 27 LINE 17.

3. INTERNAL SURFACES:

(C8) (C9) (a) INSIDE SURFACES OF ALL CARGO PIPING INCLUDING TANK STAND PIPE FOR INERT GAS PURGE AND TANK WASHING SYSTEM 6 INCHES AND ABOVE IS TO BE COATED WITH DEVRAN 201/230 OR 230 FD EPOXY PAINT SYSTEM. WELDED JOINTS INSIDE CARGO PIPING 30 INCHES AND ABOVE SHALL BE CLEANED AND TOUCH-UP PAINT APPLIED AFTER WELDING IS COMPLETED. WELDED JOINTS INSIDE PIPES LESS THAN 30 INCHES THAT CAN BE REACHED AT ARMS LENGTH AND ALL FLANGES INSTALLED IN THE FIELD TO BE CLEANED AND TOUCH-UP PAINT APPLIED AFTER WELDING IS COMPLETE.

(b) FOR ADDITIONAL PIPE COATING INFORMATION SEE SHT. 32.

N.N. FORM N16-52

PAINTING SCHEDULE GENERAL NOTES	HULL 613C & 614C	MARAD HULL NO. 309 & 310	SHT NO. 11	REV D
		NN DWG NO. 8300-40		

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PIPING NOTES CON'T

4. **PIPE HANGERS:**

(A-1) PIPE HANGERS ARE TO BE ABRASIVE BLASTED AND PRIMED WITH DEVRAN 308. HANGERS PRIMED WITH RUST BAN 191, A 3-5 MIL DFT INORGANIC ZINC SILICATE COATING MANUFACTURED BY MATCOTE OR EQUAL, TO COMPLY WITH REF. 24 WILL BE AN ACCEPTABLE EQUIVALENT. FAYING SURFACE OF PIPE/PIPE HANGER SHALL NOT REQUIRE ADDITIONAL COATS OF PAINT. (B) PIPE HANGERS SHALL BE FINISH PAINTED THE SAME AS SURROUNDING STRUCTURE.

5. **POTABLE WATER SYSTEM MARKING:**

(D_2) THE PIPING OF THE POTABLE WATER SYSTEM (INCLUDING THE FILLING LINE) SHALL BE PAINTED WITH A LIGHT BLUE STRIPE AT EACH BRANCH FITTING, ON EACH SIDE OF PARTITIONS, DECKS AND BULKHEADS. AND AT INTERVALS NOT TO EXCEED 15 FEET EXCEPT IN QUARTERS AND DINING ROOMS.

K. DECKHOUSE UNIT :

1. DESCRIPTION OF UNIT:

THE FOLLOWING DECKHOUSE UNIT WILL BE BUILT BY SUBCONTRACTOR: "ALL SPACES ENCOMPASSED ON THE UPPER DECK LEVEL AND ABOVE, BETWEEN FRAMES 44 AND 58 AND 63'-0" OFF THE CENTERLINE P/S, INCLUDING ANY PLATFORM APPURTENANT THERE TO AS WELL AS P/S NAVIGATING BRIDGE WINGS EXCLUDING VERTICAL STRUT SUPPORTS. THE UNIT WILL NOT INCLUDE RADAR MAST, ELEVATOR EQUIPMENT, NAVIGATIONAL AND CONTROL EQUIPMENT."

2. PAINT WORK TO BE ACCOMPLISHED BE SUB-CONTRACTOR

THE FOLLOWING PAINT WORK WILL BE ACCOMPLISHED BY THE SUB-CONTRACTOR ON THE ABOVE DECKHOUSE UNIT:

(a) ABRASIVE BLASTING AND ONE COAT OF PRE-CONSTRUCTION PRIMER (DEVRAN 308) PRIOR TO FABRICATION OF STEEL.

(b) CLEANING AND TOUCH-UP COATING (DEVRAN 302) OF ALL WELDING AREAS AFTER FABRICATION AND PRIOR TO APPLICATION OF REGULAR COATING SYSTEM. SEE NOTE "A-15".

(c) CLEANING OR DEGREASING OF GALVANIZED RAILS, ETC. AND APPLICATION OF WASH PRIMER AND FINISH COATS ON INTERIOR SURFACES ONLY. EXTERIOR GALVANIZED SURFACES TO BE LEFT UNTREATED.

(d) TOUCH-UP OF DAMAGED AREAS AND ONE FULL COAT OF ZINC-RICH PRIMER (DEVRAN 302) ON ALL EXTERIOR SURFACES.

(C_{13}) (e) ALKALINE RESISTANT PAINTING OF BATTERY LOCKER INTERIOR.

(f) INTERIOR STEEL SURFACES BEHIND INSULATION OR JOINER WORK WILL BE GIVEN ONE COAT OF PRIMER OVER THE PRE-CONSTRUCTION PRIMER, AS REQUIRED. THE STEEL BEHIND REFRIGERATED STORES INSULATION SHALL BE GIVEN TWO COATS OF AN ASPHALT EMULSION; FLINTKOTE HYDRAULT OR EQUAL.

(g) INTERIOR UNCOVERED STEEL BULKHEADS WILL BE GIVEN ONE COAT EPOXY ESTER PRIMER AND TWO COATS OF ALKYD FINISH.

(n) BARE INTERIOR STEEL DECKS WILL BE GIVEN ONE COAT OF EPOXY ESTER PRIMER AND TWO FINISH COATS. THE FINAL FINISH COAT SHALL HAVE NON-SKID ADDED WHERE NECESSARY.

(j) THE COMPLETE FACTORY BAKED ENAMEL FINISHING OF ALL DOORS AND FURNITURE WE FURNISH.

PAINTING SCHEDULE GENERAL NOTES	HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 12	REV D

H.N. FORM N10-32

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(DECKHOUSE NOTES CON'T)

(k) FACTORY BAKED ENAMEL FINISH AS REQUIRED FOR ALL EXPOSED JOINER TRIM AND CASINGS WE FURNISH IN WAY OF PREFINISHED PANELING, IN COLORS TO BLEND WITH FACE VENEERS.

(l) ONE COAT OF BAKED ENAMEL PRIMER ON ALL OTHER METAL JOINER MATERIALS WE FURNISH WHICH ARE EITHER NOT EXPOSED OR ARE TO BE FINISH PAINTED AT THE SHIPYARD.

(m) UNEXPOSED JOINER MEMBERS (NOT OTHERWISE SPECIFIED HEREIN) SHALL HAVE A COATING OF ZINC CHROMATE PRIMER.

3. PAINT WORK NOT TO BE ACCOMPLISHED BY SUB-CONTRACTOR:

(a) FINISH PAINTING OF DECKHOUSE UNIT EXTERIOR PLATING, DECKS, RAILS, ETC.

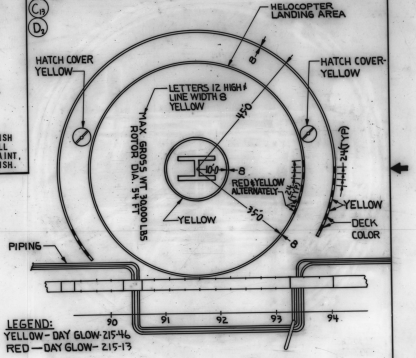
(b) ANY PAINTING OR TOUCH-UP REQUIRED ON THE DECKHOUSE UNIT AFTER DELIVERY TO THE SHIPBUILDER AT CARTERET.

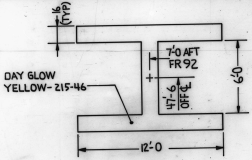
(c) PAINTING OR TOUCH-UP OF JOINER WORK AND FURNITURE WE FURNISH REQUIRED TO BE PERFORMED IN THE SHIPBUILDER'S YARD. WE WILL HOWEVER, SUPPLY SUFFICIENT QUANTITIES OF AIR-DRY ENAMEL PAINT, MATCHING COLORS WE FURNISH, AS REQUIRED FOR ITEMS WE FURNISH.

L. HELICOPTER MARKINGS:

NOTE: DAY GLOW YELLOW PAINT IS TO BE APPLIED OVER SLIP-RESISTANT DECK COVERING.

Ⓐ-1 Ⓔ Ⓒ13 Ⓓ2


HELOCOPTER LANDING AREA
8
HATCH COVER YELLOW
HATCH COVER-YELLOW
LETTERS 12 HIGH & LINE WIDTH 8 YELLOW
MAX GROSS WT 30,000 LBS
ROTOR DIA. 54 FT
45'-0
10'-0
8
24(TYP)
24(TYP)
RED & YELLOW ALTERNATELY
35'-0
8
YELLOW
YELLOW
DECK COLOR
PIPING
90
91
92
93
94
LEGEND:
YELLOW - DAY GLOW - 215-46
RED — DAY GLOW - 215-13


16 (TYP)
7'-0 AFT FR 92
47'-6 OFF ℄
6'-0
DAY GLOW YELLOW - 215-46
12'-0

PAINTING SCHEDULE GENERAL NOTES	HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 13	REV E

N.N. FORM N18-58

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	LINE NO.	ABBREVIATION	PAINT DESIGNATION	COLOR	TYPE PAINT	TYPE THINNER	DRY FILM THICKNESS COAT
	1						
	2	B	DULL BLACK FORMULA 104 MIL-P-15146	BLACK	ALKYD	MINERAL SPIRITS	1.5 MILS/37 MICRONS
C7	3	BC	BALLAST-COAT X3950-7	BLACK	RUST INHIBITOR	NONE	AS APPLIED
C10	4	CB	DEVRAN MD-4448	BLACK	CHLORINATED RUBBER	NO.20 SOLVENT MD-542	2.0 MILS/50 MICRONS
A-1	5	C	DEVRAN FINISH PAINT - MD * TO SUIT COLOR	SEE SHT 30	CHLORINATED RUBBER	NO.20 SOLVENT MD-542	2.0 MILS/50 MICRONS
D1 C10	6	CN	DEVRAN 237 M (NON SKID)	HAZE GRAY	EPOXY	NO.1 SOLVENT MD-1931	4.0 MILS/100 MICRONS
	7	CP	DEVRAN MD 3504 PRIMER	BUFF YELLOW	CHLORINATED RUBBER	NO.20 SOLVENT MD-542	3.0 MILS/75 MICRONS
C10	8	CG	DEVRAN MD 3508	HAZE GRAY	CHLORINATED RUBBER	NO.20 SOLVENT MD-542	2.0 MILS/50 MICRONS
	9	CW	CARBO-WELD #11-(SHOP PRIMER USED AFTER 7-10-78)	GRAY	ZINC SILICATE	CARBOLINE #33	0.75 MILS/18 MICRONS
C13	10	DO	DEVRAN 230	OLIVE	EPOXY	NO.2 SOLVENT-MD-3630	6.5 MILS/163 MICRONS
	11	DC	DEVRAN 230	MET. RED BROWN	EPOXY	NO.2 SOLVENT-MD-3630	6.5 MILS/163 MICRONS
B A-1	12	DA	DEVRAN 214 ANTI-FOULING	RED	VINYL	NO.2 SOLVENT MD-3630	2.0 MILS/50 MICRONS
B	13	DB	DEVRAN 201	BUFF	SOLUTION EPOXY	NO.1 SOLVENT MD-1931	2.0 MILS/50 MICRONS
C13	14	DM	DEVRAN 230 (FAST DRY)	MET-RED-BROWN	EPOXY	NO.10 SOLVENT MD-3960	6.5 MILS/163 MICRONS
	15	DF	DEVTAR 5A	BROWN	MODIFIED COAL TAR	NO.2 SOLVENT MD-3630	8.0 MILS/200 MICRONS
	16	DP	DEVTAR 5A	BLACK	MODIFIED COAL TAR	NO.2 SOLVENT MD-3630	8.0 MILS/200 MICRONS
B C13	17	DR	DEVRAN 230 (FAST DRY)	MET. GREEN	EPOXY	NO.10 SOLVENT-MD 3960	6.5 MILS/163 MICRONS
	18	DT	DEVRAN 230 (USED PRIOR TO DEC. 1, 1977)	MET-RED-BROWN	EPOXY	NO.2 SOLVENT MD-3630	8.0 MILS/200 MICRONS
	19		DEVRAN 230 - SEE NOTE B.11	OLIVE	EPOXY	NO.2 SOLVENT-MD-3630	8.0 MILS/200 MICRONS
	20		DEVRAN 230 (FAST DRY)	MET. GREEN	EPOXY	NO.10 SOLVENT-MD-3960	8.0 MILS/200 MICRONS
	21	EB	DEVRAN 244 HIGH SOLIDS	BLUE	SOLUTION EPOXY	NO.1 SOLVENT MD-1931	3.0 MILS/100 MICRONS
C13 A-1	22	EE	DEVRAN MD 4473 OR 4578*	RED OR WHITE	EPOXY ESTER	NO.20 SOLVENT MD-542	2.0-3.0 MILS/50-75 MICRONS
	23	EO	DEVRAN 244 HIGH SOLIDS PRIMER	ORANGE	SOLUTION EPOXY	NO.1 SOLVENT MD-1941	5.0 MILS/125 MICRONS
	24	ER	DEVRAN 244 HIGH SOLIDS FINISH	RED	SOLUTION EPOXY	NO.1 SOLVENT MD-1931	5.0 MILS/125 MICRONS
	25	EW	DEVRAN 244 HIGH SOLIDS	WHITE	SOLUTION EPOXY	NO.1 SOLVENT MD-1931	3.0 MILS/75 MICRONS
C13	26	EF	CARBOLINE 110	WHITE	EPOXY ESTER	CARBOLINE NO. 45	1.5 MILS/37 MICRONS
	27	EG	CARBOLINE 110	GRAY	EPOXY ESTER	CARBOLINE NO. 45	1.5 MILS/37 MICRONS
	28	GD	NEWPORT NEWS GRAY DECK (FORMULA 20L) JAN-P-700	GRAY	ALKYD	MINERAL SPIRITS	2.0 MILS/50 MICRONS
	29	GE	EQUIPMENT GRAY ENAMEL FORM 111 MIL-E-15090	GRAY	ALKYD	NONE	1.5 MILS/37 MICRONS
	30	GRC	GALVANIZING REPAIR PAINT (N.N. A-1) MIL-P-21035	GRAY	HIGH ZINC DUST	NONE	AS APPLIED
	31						
	32	IZ	DEVRAN CATHA-COAT 302	GREEN	MODIFIED INORGANIC ZINC	NO.1 SOLVENT MD-1931	3.0 MILS/75 MICRONS
C1	33	IP	MOBIL 13-R-10 PRIMER	RED	WATER BASE EPOXY	NONE	AS APPLIED
	34	IF	MOBIL 98-W-10 HI-BUILD FINISH	WHITE	WATER BASE EPOXY	NONE	AS APPLIED
	35						

* DEVRAN MD 4578 WHITE
USED AFTER 3-1-78

MATERIAL ABBREVIATIONS

HULL 613C & 614C	MARAD HULL NO. 309 & 310	SHT NO. 14	REV D
	NN DWG NO. 8300-40		

N.N. FORM N16-

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LINE NO.	ABBREVIATION	PAINT DESIGNATION	COLOR	TYPE PAINT	TYPE THINNER	DRY FILM THICKNESS COAT
36						
37						
38	R	RUST VETO #80	CLEAR	OIL	NONE	AS APPLIED
39	RA	HEAT RESISTING ALUMINUM (TT-P-28)	ALUMINUM	SILICONE VARNISH	MINERAL SPIRITS	1.0 MIL/25 MICRONS
40	RD	NEWPORT NEWS RED DECK (FORMULA 23) MIL-P-18210	RED	PHENOLIC VARNISH	MINERAL SPIRITS	2.0 MILS/50 MICRONS
41	RC	RUST PREVENTATIVE COMPOUND TECTYL 890 MIL-P-16173 GR I	BLACK	OIL	NONE	AS APPLIED
42	RP	RUST PREVENTATIVE COMPOUND TECTYL 511M	OPAQUE	OIL	NONE	AS APPLIED
43						
Ⓒ Ⓑ 44	SP	DEVRAN CATHA-COAT 308 SHOP-PRIMER USED PRIOR TO 7-10-78 "CW" USED AFTER 7-10-78	SEE NOTE A-7	ZINC SILICATE	NO.19 SOLVENT MD-3988	.75-1.0 MIL/19.25 MICRONS
45	SW	NEWPORT NEWS WHITE (TT-E-490)	WHITE	SILICONE ALKYD	MINERAL SPIRITS	2.0 MILS/50 MICRONS
46						
47						
48						
49	TP	TOUCH-UP COAT DEVRAN CATHA-COAT 302	GREEN	MODIFIED INORGANIC ZINC	NO.1 SOLVENT MD-1931	2.0-3.0 MILS/50-75 MICRONS
50						
51						
52						
53						
54	WA	NEWPORT NEWS SOFT WHITE (FORMULA 124/66) MIL-E-17970	WHITE	CHLORINATED ALKYD	MINERAL SPIRITS	2.0 MILS/50 MICRONS
55	WP	DEVRAN WASH-COAT PRIMER (FORMULA 117)	GREEN	VINYL	NONE	0.5 MIL/12 MICRONS
56						
57						
58						
59	YL	NEWPORT NEWS YELLOW STRIPING (FORM. 42) MIL-P-2583	YELLOW	ALKYD	MINERAL SPIRITS	1.0 MIL/25 MICRONS
60						
61						
62						
63						
64						
65						
66						
67						
68						
69						
70						

MATERIAL ABBREVIATIONS	HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 15	REV D

N. N. FORM N 18-22

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PAINTING SCHEDULE

LINE NO.	SPACE	DESCRIPTION TOP	DESCRIPTION SIDE	DESCRIPTION DK	DESCRIPTION OTHER CONDITIONS	1ST. COAT MATL	1ST. COAT FORMULA	2ND. COAT MATL	2ND. COAT FORMULA	3RD. COAT MATL	3RD. COAT FORMULA	4TH. COAT MATL	4TH. COAT FORMULA	5TH. COAT MATL	5TH. COAT FORMULA	REMARKS	GEN NOTE
1	FORE PEAK TANK					SP	308	TP	302	DB	201	DT	230				J1
2	AFTER PEAK TANK					SP	308	TP	302	DB	201	DT	230				J1
3	CENTER TANK NO.4				SWB	SP	308	TP	302	DB	201	DT	230				C6
4	SALT WATER BALLAST P/S				78'-4 FLAT APPROX FR 23-47	SP	308	TP	302	DB	201	DT	230				J1
Ⓑ (A-1) 5	DBL BOTTOM TANK FR 32-58				SWB	SP	308	TP	302	DB	201	DT	230				
6	CENTER TANKS NO. ,2,3,5,6,7,				CARGO OIL TOP & 6' DOWN	SP	308	TP	302	DB	201	DT	230			℄ #1 & 8 - NO PAINT	C-4
7	WING TANKS P/S NO. 7 & 9				CARGO OIL TOP & 6' DOWN	SP	308	TP	302	DB	201	DT	230			WINGS #1-6, 8. 10. & 11- NO PAINT	C-4
8	WING TANK P/S NO.12				CARGO OIL / SLOP TANKS	SP	308	TP	302	DB	201	DT	230				C-4
9	BILGE WATER STORAGE TANK					SP	308	TP	302	DB	201	DT	230				
10	CHAIN LOCKERS					SP	308	TU	302	DP	5A	DF	5A				
11	CHAIN LOCKER SUMPS					SP	308	IZ	302	DP	5A	DF	5A				
12	SLUDGE TANK					SP	308	TP	302	DP	5A	DF	5A				
13	POTABLE WATER TANK				ABRASIVE BLAST	EB	244	EW	244								
14	DISTILLED WATER TANK				ABRASIVE BLAST	EB	244	EW	244								
15	DIESEL OIL TANK				UNPAINTED	SP	308										C2
16	LUBE OIL STORAGE TANK				ABRASIVE BLAST	R	80										
17	LUBE OIL SETTLING TANK				ABRASIVE BLAST	R	80										
18	FUEL OIL SETTLING TKS P/S				UNPAINTED	SP	308										C2
19	FUEL OIL TANKS P/S				UNPAINTED	SP	308										C2
20	LOW SULPHUR FUEL OIL TK				UNPAINTED	SP	308										C2
Ⓑ 21	INACCESSIBLE VOID				AFT (FR 4) - 60' MACHY FLAT	SP	308	TP	302								C3
22	SEWAGE HOLDING TANK					SP	308	TP	302	DP	5A	DF	5A				
23	ATMOSPHERE DRAIN TANK				NO PAINT	RP	511M										
24	DIESEL OIL TANK					SP	308										C2
25	USED OIL TANK				NO PAINT	R	80										
Ⓑ 26	L.O. PURIFIER DRAIN TANK				ABRASIVE BLAST-(BY VENDOR)	R	80									SEE REF. 27	
27	SAND BOX				GALVANIZED											SEE NOTE C-6	A-13
28	STRAINER TANK					SP	308	DP	5A	DF	5A						
29	CLEAN & OIL RAG LOCKER				GALVANIZED												
Ⓑ 30	DIESEL ENG L.O. STOR TK				ABRASIVE BLAST-(BY VENDOR)	R	80									SEE REF. 27 ↓	
Ⓑ 31	DRAIN INSPECTION TK				ABRASIVE BLAST-(BY VENDOR)	RP	511M										
Ⓑ 32	L.O. GRAVITY TK				ABRASIVE BLAST-(BY VENDOR)	R	80										
(A-1) 33	INACCESSIBLE VOIDS				WHERE PAINTING IS PRACTICAL	SP	308	TP	302							PAINT PRIOR TO MAKING VOID	
					WHERE PAINTING IS NOT PRACTICAL	R	80									FILL & DRAIN	

TANKS & VOIDS- INTERIOR

HULL 613C & 614C	MARAD HULL NO. 309 & 310	SHT NO. 16	REV D
	NN DWG NO. 8300-40		

N.N. FORM N16-2

8300-40

MICRO-MASTER® 105 mm

K+E ARLINGTON • WASHINGTON • BETHESDA ALEXANDRIA • RICHMOND • NORFOLK

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PAINTING SCHEDULE

HOLD DECK, 33' & 60' FLAT

	LINE NO.	SPACE	TOP	SIDE	DK	OTHER CONDITIONS	1ST. COAT MATL	1ST. COAT FORMULA	2ND. COAT MATL	2ND. COAT FORMULA	3RD. COAT MATL	3RD. COAT FORMULA	4TH. COAT MATL	4TH. COAT FORMULA	5TH. COAT MATL	5TH. COAT FORMULA	REMARKS	GEN NOTE
C13 B	1	MACHINERY SPACE (ABOVE BILGE LEVEL)	X				SP	308	TP	302	EE	4473	WA	124	WA	124	LINE OF BILGE IS 14'-0 ABL	D7 D9
				X			SP	308	TP	302	EE	4473	WA	124	WA	124		
					X		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
C8 A-1 C13	2	MACHINERY SPACE (BELOW BILGE LEVEL)				UP TO 6" BELOW BOTTOM GRATING	SP	308	TP	302	DB	201	DM	230				
	3	ENCLOSED OPERATING STATION	X				SP	308	TP	302	EE	4473	WA	124	WA	124		A14
				X			SP	308	TP	302	EE	4473	WA	124	WA	124		
					X		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
	4	ENGINEERS STOREROOM	X				SP	308	TP	302	EE	4473	WA	124	WA	124		D8
				X			SP	308	TP	302	EE	4473	WA	124	WA	124		D7
					X		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
C13 B	5	ENGINEERS WORKSHOP	X				SP	308	TP	302	EE	4473	WA	124	WA	124		D8
				X			SP	308	TP	302	EE	4473	WA	124	WA	124		D7
					X		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
	6	ELECTRICAL WORKSHOP	X				SP	308	TP	302	EE	4473	WA	124	WA	124		D8
				X			SP	308	TP	302	EE	4473	WA	124	WA	124		D7
					X		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
	7	FIRE PUMP ROOM	X				SP	308	TP	302	EE	4473	WA	124	WA	124		
				X			SP	308	TP	302	EE	4473	WA	124	WA	124		
					X		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
	8	PUMP ROOM (CARGO)	X				SP	308	TP	302	IZ	302	EE	4473	SW		SW	
				X			SP	308	TP	302	IZ	302	EE	4473	SW		SW	
					X		SP	308	TP	302	IZ	302	EE	4473	GD	20-L	GD 20-L	
	9	ACCESS & ESCAPE TRUNKS	X				SP	308	TP	302	EE	4473	WA	124	WA	124	*DECK FINISH COATS SAME AS COMP'T IT ENTERS INTO	
				X			SP	308	TP	302	EE	4473	WA	124	WA	124		
					X		SP	308	TP	302	EE	4473	*		*			
	10	ELEVATOR TRUNK	X				SP	308	TP	302	EE	4473					APPLY FINISH COATS TO AREAS EXPOSED TO NORMAL VIEW.	
				X			SP	308	TP	302	EE	4473						
					X		SP	308	TP	302	EE	4473						
	11	PIPING				SEE SHT 11 NOTE "J"												
	12	VENTS				SEE SHT 10 NOTE "G"												
	13	MACHINERY				SEE SHT 10 NOTE "F"												
C13 B	14	WATER CLOSET	X	X			SP	308	TP	302	EE	4473	WA	124	WA	124		
					X		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		

INTERIOR	HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 17	REV D

N.N. FORM N16-2

8300-40

MICRO-MASTER® 105 mm
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PAINTING SCHEDULE

C13 B

C13 B

LINE NO.	SECOND DK & 78'-4 FLAT SPACE	TOP	SIDE	DK	OTHER CONDITIONS	1ST. COAT MATL	1ST. COAT FORMULA	2ND. COAT MATL	2ND. COAT FORMULA	3RD. COAT MATL	3RD. COAT FORMULA	4TH. COAT MATL	4TH. COAT FORMULA	5TH. COAT MATL	5TH. COAT FORMULA	REMARKS	GEN NOTE
1	BOATSWAIN STOREROOM & CORDAGE SPACE (FWD)	X				SP	308	TP	302	EE	4473	WA	124	WA	124		D7
			X			SP	308	TP	302	EE	4473	WA	124	WA	124		
				X		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
2	STEERING GEAR ROOM	X				SP	308	TP	302	EE	4473	WA	124	WA	124		
			X			SP	308	TP	302	EE	4473	WA	124	WA	124		
				X		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
3	PASSAGE	X				SP	308	TP	302	EE	4473	WA	124	WA	124		D6
			X			SP	308	TP	302	EE	4473	WA	124	WA	124		
				X		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
4	ACCESS & ESCAPE TRUNKS	X				SP	308	TP	302	EE	4473	WA	124	WA	124	*DECK FINISH COATS SAME AS COMP'T IT ENTERS INTO.	
			X			SP	308	TP	302	EE	4473	WA	124	WA	124		
				X		SP	308	TP	302	EE	4473	*		*			
5	ELEVATOR TRUNK	X				SP	308	TP	302	EE	4473					APPLY FINISH COATS TO AREAS EXPOSED TO NORMAL VIEW	
			X			SP	308	TP	302	EE	4473						
				X		SP	308	TP	302	EE	4473						
6	PIPING				SEE SHT 11 NOTE "J"												
7	VENTS				SEE SHT 10 NOTE "G"												
8	MACHINERY SPACE				SEE SHT 17 LINES 1,2 & 13												
9	FIRST LINE ASHORE REEL & POWER PACK ROOM	X				SP	308	TP	302	EE	4473	WA	124	WA	124		D7
			X			SP	308	TP	302	EE	4473	WA	124	WA	124		
				X		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
10	BOATSWAIN STOREROOM (AFT)	X				SP	308	TP	302	EE	4473	WA	124	WA	124		D7
			X			SP	308	TP	302	EE	4473	WA	124	WA	124		
				X		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
11	CORDAGE SPACE (AFT)	X				SP	308	TP	302	EE	4473	WA	124	WA	124		D7
			X			SP	308	TP	302	EE	4473	WA	124	WA	124		
				X		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		

INTERIOR	HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 18	REV D

N.N. FORM N18-23

8300-40

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PAINTING SCHEDULE

	LINE NO.	UPPER & CAMBER DK 30" ABV UPPER DK	DESCRIPTION				1ST. COAT		2ND. COAT		3RD. COAT		4TH. COAT		5TH. COAT		REMARKS	GEN NOTE
		SPACE	TOP	SIDE	DK	OTHER CONDITIONS	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA		
	1	EMERGENCY DIESEL GENERATOR ROOM	☒				SP	308	TP	302	EE	4473	WA	124	WA	124		
				☒			SP	308	TP	302	EE	4473	WA	124	WA	124		
					☒		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
C13 B	2	PAINT ROOM, DECK MAINTENANCE SHOP & DECK LOCKER	☒				SP	308	TP	302	EE	4473	WA	124	WA	124		D7
				☒			SP	308	TP	302	EE	4473	WA	124	WA	124		
					☒		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
	3	PUMP ROOM ACCESS ENTRANCE	☒				SP	308	TP	302	EE	4473	WA	124	WA	124		
				☒			SP	308	TP	302	EE	4473	WA	124	WA	124		
					☒		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
	4	GALLEY, SERVING AREA & NIGHT PANTRY	☒				SP	308	TP	302	EE	4473	SEE	REF 11				
				☒			SP	308	TP	302	EE	4473	SEE	REF 5				
					☒		SP	308	SEE	REF 2								
	5	SOILED LINEN LOCKER, CLEAN LINEN LOCKER, HOTEL & SUNDRY STORES, STOREROOM	☒				SP	308	TP	302	EE	4473	SEE	REF 11				
				☒			SP	308	TP	302	EE	4473	SEE	REF 5				
					☒		SP	308	SEE	REF 2								
	6	SHIPS SERVICE LAUNDRY & CREW LAUNDRY	☒				SP	308	TP	302	EE	4473	SEE	REF 11				
				☒			SP	308	TP	302	EE	4473	SEE	REF 5				
					☒		SP	308	SEE	REF 2								
C13	7	FOAM ROOM	☒				SP	308	TP	302	EE	4473	WA	124	WA	124		
				☒			SP	308	TP	302	EE	4473	WA	124	WA	124		
					☒		SP	308	SEE	REF 2								
	8	SLOT CHEST	☒				SP	308	TP	302	EE	4473	SEE	REF 11				
				☒			SP	308	TP	302	EE	4473	SEE	REF 5				
					☒		SP	308	SEE	REF 2								
C13	9	GARBAGE/COMPACTOR ROOM	☒				SP	308	TP	308	EE	4473	WA	124	WA	124		
				☒			SP	308	TP	308	EE	4473	WA	124	WA	124		
					☒		SP	308	SEE	REF 2								
	10	CHANGE ROOM	☒				SP	308	TP	302	EE	4473	SEE	REF 11				
				☒			SP	308	TP	302	EE	4473	SEE	REF 5				
					☒		SP	308	SEE	REF 2								
	11	CREW MESSROOM	☒				SP	308	TP	302	EE	4473	SEE	REF 11				
				☒			SP	308	TP	302	EE	4473	SEE	REF 5				
					☒		SP	308	SEE	REF 2								

N.N. FORM N18-23

INTERIOR

HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 19	REV D

8300-40

MICRO-MASTER® 105 mm

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PAINTING SCHEDULE

LINE NO.	UPPER & CAMBER DK 30" ABV UPPER DK	DESCRIPTION				1ST. COAT		2ND. COAT		3RD. COAT		4TH. COAT		5TH. COAT		REMARKS	GEN NOTE
	SPACE	TOP	SIDE	DK	OTHER CONDITIONS	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA		
12	OFFICER'S MESSROOM	☒				SP	308	TP	302	EE	4473	SEE	REF 11				
			☒			SP	308	TP	302	EE	4473	SEE	REF 5				
				☒		SP	308	SEE	REF 2								
13	DRY PROVISION STOREROOM	☒				SP	308	TP	302	EE	4473	SEE	REF 11				
			☒			SP	308	TP	302	EE	4473	SEE	REF 5				
				☒		SP	308	SEE	REF 2								
14	DECK WC, BATHS	☒				SP	308	TP	302	EE	4473	SEE	REF 11			ALSO REF 17	
			☒			SP	308	TP	302	EE	4473	SEE	REF 5				
				☒		SP	308	SEE	REF 2								
15	STAIRWAYS, STAIR TOWER, PASSAGEWAYS, VESTIBULES & LOBBY	☒				SP	308	TP	302	EE	4473	SEE	REF 11				
			☒			SP	308	TP	302	EE	4473	SEE	REF 5				
				☒		SP	308	SEE	REF 2								
(C13) 16	LAUNDRY SUPPLY LKR, D.C. LKR OILSKIN LKR & CG LKR	☒				SP	308	TP	302	EE	4473	SEE	REF 11				
			☒			SP	308	TP	302	EE	4473	SEE	REF 5				
				☒		SP	308	SEE	REF 2								
(C13)(B) 17	ESCAPE TRUNK, ACCESS TRUNK & BOOBY HATCH	☒				SP	308	TP	302	EE	4473	WA	124	WA	124		
			☒			SP	308	TP	302	EE	4473	WA	124	WA	124		
				☒		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
18	ELEVATOR TRUNK	☒	☒			SP	308	TP	302	EE	4473					APPLY FINISH COATS TO AREAS EXPOSED TO NORMAL VIEW	
				☒		SP	308	TP	302	EE	4473						
19	CABLEWAY					SP	308	TP	302	EE	4473						
(C13)(B) 20	DECK EQUIP STOREROOMS (UNDER DK HOUSE)	☒				SP	308	TP	302	EE	4473	WA	124	WA	124		
			☒			SP	308	TP	302	EE	4473	WA	124	WA	124		
				☒		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
21	REFRIGERATED STOREROOM (FREEZE & CHILL)				SEE REF 22												D1
(C13) 22	BATTERY LOCKER	☒	☒			SP	308	TP	302	EE	4473	EF	110				
				☒		SP	308	TP	302	EE	4473	EG	110				
(C13) 23	VOID FR 44-58 BET. DECKS	☒	☒	☒		SP	308	TP	302	EE	4473	SW	—				

INTERIOR	HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 20	REV D

N.N. FORM N18-23

8300-40

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PAINTING SCHEDULE

	LINE NO.	"A" DECK SPACE	DESCRIPTION TOP	 SIDE	 DK	 OTHER CONDITIONS	1ST. COAT MATL	 FORMULA	2ND. COAT MATL	 FORMULA	3RD. COAT MATL	 FORMULA	4TH. COAT MATL	 FORMULA	5TH. COAT MATL	 FORMULA	REMARKS	GEN NOTE
	1	A/C EQUIP & FAN ROOM	☒				SP	308	TP	302	EE	4473	WA	124	WA	124		
(C13) (B)				☒			SP	308	TP	302	EE	4473	WA	124	WA	124		
					☒		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
	2	LIBRARY & DARK ROOM	☒				SP	308	TP	302	EE	4473	SEE	REF 12				
				☒			SP	308	TP	302	EE	4473	SEE	REF 6				
					☒		SP	308	SEE	REF 2								
	3	STATEROOMS & TREATMENT ROOM	☒				SP	308	TP	302	EE	4473	SEE	REF 12				
				☒			SP	308	TP	302	EE	4473	SEE	REF 6				
					☒		SP	308	SEE	REF 2								
	4	CREW BAGGAGE LKR	☒				SP	308	TP	302	EE	4473	SEE	REF 12				
(C13)				☒			SP	308	TP	302	EE	4473	SEE	REF 6				
					☒		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
	5	CG LKR	☒				SP	308	TP	302	EE	4473	SEE	REF. 12				
(C13)				☒			SP.	308	TP	302	EE	4473	WA	124	WA	124	SEE REF. 6	
					☒		SP	308	SEE	REF. 2								
	6	ELEVATOR TRUNK	☒				SP	308	TP	302	EE	4473					APPLY FINISH COATS TO AREAS EXPOSED TO NORMAL VISION	
				☒			SP	308	TP	302	EE	4473						
					☒		SP	308	TP	302	EE	4473						
	7	CABLEWAY ELEC PANELS					SP	308	TP	302	EE	4473						
	8	STAIR TOWERS & PASSAGEWAYS	☒				SP	308	TP	302	EE	4473	SEE	REF 12				
				☒			SP.	308	TP	302	EE	4473	SEE	REF 6				
					☒		SP	308	SEE	REF 2								
	9	BATHS	☒				SP	308	TP	302	EE	4473	SEE	REF 12			ALSO SEE REF 17	
				☒			SP	308	TP	302	EE	4473	SEE	REF 6				
					☒		SP	308	SEE	REF 2								
	10	CARGO CONTROL ROOM	☒				SP	308	TP	302	EE	4473	SEE	REF. 12				
(C13)				☒			SP	308	TP	302	EE	4473	SEE	REF 6				
					☒		SP	308	SEE	REF. 2								

N.N. FORM N18-23

INTERIOR	HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 21	REV D

8300-40

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PAINTING SCHEDULE

	LINE NO.	"B" DECK	DESCRIPTION				1ST. COAT		2ND. COAT		3RD. COAT		4TH. COAT		5TH. COAT		REMARKS	GEN NOTE
		SPACE	TOP	SIDE	DK	OTHER CONDITIONS	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA		
	1	STATEROOMS	☒				SP	308	TP	302	EE	4473	SEE	REF 13				
				☒			SP	308	TP	302	EE	4473	SEE	REF 7				
					☒		SP	308	SEE	REF 2								
	2	CREW LOUNGE	☒				SP	308	TP	302	EE	4473	SEE	REF 13				
				☒			SP	308	TP	302	EE	4473	SEE	REF 7				
					☒		SP	308	SEE	REF 3								
	3	HOTEL STORES	☒				SP	308	TP	302	EE	4473	SEE	REF 13				
				☒			SP	308	TP	302	EE	4473	SEE	REF 7				
					☒		SP	308	SEE	REF 2								
	4	SERVICE AREA	☒				SP	308	TP	302	EE	4473	WA	124	WA	124		
				☒			SP	308	TP	302	EE	4473	WA	124	WA	124		
					☒		SP	308	TP	302	EE	4473	GD	20L	GD	20L		
	5	CG LKR	☒				SP	308	TP	302	EE	4473	SEE	REF 13				
C13				☒			SP	308	TP	302	EE	4473	WA	124	WA	124	SEE REF 7	
					☒		SP	308	SEE	REF 2								
C13	6	CREW BAGGAGE LKR	☒				SP	308	TP	302	EE	4473	SEE	REF 13				
				☒			SP	308	TP	302	EE	4473	SEE	REF 7				
					☒		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
	7	ELEVATOR TRUNK	☒				SP	308	TP	302	EE	4473					APPLY FINISH COATS TO AREAS EXPOSED TO NORMAL VISION	
				☒			SP	308	TP	302	EE	4473						
					☒		SP	308	TP	302	EE	4473						
	8	CABLEWAY ELEC PANELS					SP	308	TP	302	EE	4473						
	9	STAIR TOWERS & PASSAGEWAYS	☒				SP	308	TP	302	EE	4473	SEE	REF 13				
				☒			SP	308	TP	302	EE	4473	SEE	REF 7				
					☒		SP	308	SEE	REF 2								
	10	BATHS	☒				SP	308	TP	302	EE	4473	SEE	REF 13			ALSO SEE REF 17	
				☒			SP	308	TP	302	EE	4473	SEE	REF 7				
					☒		SP	308	SEE	REF 2								

HULL	MARAD HULL NO.	SHT NO.	REV
613C & 614C	309 & 310	22	D
	NN DWG NO. 8300-40		

N.N. FORM N18-23

8300-40

MICRO-MASTER® 105 mm

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PAINTING SCHEDULE

LINE NO.	"C" DECK SPACE	DESCRIPTION TOP	 SIDE	 DK	 OTHER CONDITIONS	1ST. COAT MATL	 FORMULA	2ND. COAT MATL	 FORMULA	3RD. COAT MATL	 FORMULA	4TH. COAT MATL	 FORMULA	5TH. COAT MATL	 FORMULA	REMARKS	GEN NOTE
1	STATEROOMS	☒				SP	308	TP	302	EE	4473	SEE	REF 14				
			☒			SP	308	TP	302	EE	4473	SEE	REF 8				
				☒		SP	308	SEE	REF 2								
2	DAY ROOMS	☒				SP	308	TP	302	EE	4473	SEE	REF 14				
			☒			SP	308	TP	302	EE	4473	SEE	REF 8				
				☒		SP	308	SEE	REF 2								
3	OFFICER'S LOUNGE	☒				SP	308	TP	302	EE	4473	SEE	REF 14				
			☒			SP	308	TP	302	EE	4473	SEE	REF 8				
				☒		SP	308	SEE	REF 2								
(C_B) 4	CG LKR	☒				SP	308	TP	302	EE	4473	SEE	REF 14				
			☒			SP	308	TP	302	EE	4473	WA	124	WA	124	SEE REF. 8	
				☒		SP	308	SEE	REF. 2								
(C_B) 5	LOCKER	☒				SP	308	TP	302	EE	4473	SEE	REF 14				
			☒			SP	308	TP	302	EE	4473	WA	124	WA	124	SEE REF. 8	
				☒		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
6	ELEVATOR TRUNK	☒				SP	308	TP	302	EE	4473					APPLY FINISH COATS TO AREAS EXPOSED TO NORMAL VISION	
			☒			SP	308	TP	302	EE	4473						
				☒		SP	308	TP	302	EE	4473						
7	CABLEWAY					SP	308	TP	302	EE	4473						
8	SERVICE AREA	☒				SP	308	TP	302	EE	4473	WA	124	WA	124		
			☒			SP	308	TP	302	EE	4473	WA	124	WA	124		
				☒		SP	308	TP	302	EE	4473	GD	20L	GD	20L		
9	STAIR TOWERS & PASSAGEWAYS	☒				SP	308	TP	302	EE	4473	SEE	REF 14				
			☒			SP	308	TP	302	EE	4473	SEE	REF 8				
				☒		SP	308	SEE	REF 2								
10	BATHS	☒				SP	308	TP	302	EE	4473	SEE	REF 14			ALSO SEE REF 17	
			☒			SP	308	TP	302	EE	4473	SEE	REF 8				
				☒		SP	308	SEE	REF 2								
(C_B) 11	BONDED STORES LOCKER	☒				SP	308	TP	302	EE	4473	WA	124	WA	124		
			☒			SP	308	TP	302	EE	4473	WA	124	WA	124		
				☒		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
(C_B) 12	OFFICER'S LAUNDRY	☒				SP	308	TP	302	EE	4473	SEE	REF 14				
			☒			SP	308	TP	308	EE	4473	SEE	REF 8				
				☒		SP	308	SEE	REF. 2								

N.N. FORM N16-23

INTERIOR

HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 23	REV D

8300-40

MICRO-MASTER 105 mm
K+E
ARLINGTON • WASHINGTON • BETHESDA
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SEPT. '80

4X

PAINTING SCHEDULE

LINE NO.	"D" DECK	DESCRIPTION				1ST. COAT		2ND. COAT		3RD. COAT		4TH. COAT		5TH. COAT		REMARKS	GEN NOTE
	SPACE	TOP	SIDE	DK	OTHER CONDITIONS	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA		
1	STATEROOMS	☒				SP	308	TP	302	EE	4473	SEE	REF 15				
			☒			SP	308	TP	302	EE	4473	SEE	REF 9				
				☒		SP	308	SEE	REF 2 & 3								
2	DAYROOMS	☒				SP	308	TP	302	EE	4473	SEE	REF 15				
			☒			SP	308	TP	302	EE	4473	SEE	REF 9				
				☒		SP	308	SEE	REF 3								
3	OFFICES	☒				SP	308	TP	302	EE	4473	SEE	REF 15				
			☒			SP	308	TP	302	EE	4473	SEE	REF 9				
				☒		SP	308	SEE	REF 3								
C13 ~~4~~	~~OFFICER'S LAUNDRY~~	☒				~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~SEE~~	~~REF 15~~				
			☒			~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~SEE~~	~~REF 9~~				
				☒		~~SP~~	~~308~~	~~SEE~~	~~REF 2~~								
C13 5	OFFICER'S BAGGAGE LOCKER	☒				SP	308	TP	302	EE	4473	WA	124	WA	124		
			☒			SP	308	TP	302	EE	4473	WA	124	WA	124		
				☒		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
C13 6	CG LKR	☒				SP	308	TP	302	EE	4473	SEE	REF. 15				
			☒			SP	308	TP	302	EE	4473	WA	124	WA	124	SEE REF. 9	
				☒		SP	308	SEE	REF. 2								
C13 7	~~BONDED STORES LOCKER~~	☒				~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~(LATER)~~					
			☒			~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~(LATER)~~					
				☒		~~SP~~	~~308~~	~~(LATER)~~									
C13 8	CONTROL EQUIP ROOM	☒				SP	308	TP	302	EE	4473	WA	124	WA	124		
			☒			SP	308	TP	302	EE	4473	WA	124	WA	124		
				☒		SP	308	TP	302	EE	4473	GD	20-L	GD	20-L		
9	ELEVATOR TRUNK	☒				SP	308	TP	302	EE	4473					APPLY FINISH COATS TO AREAS EXPOSED TO NORMAL VISION	
			☒			SP	308	TP	302	EE	4473						
				☒		SP	308	TP	302	EE	4473						
10	CABLEWAY					SP	308	TP	302	EE	4473						
11	STAIR TOWERS & PASSAGEWAYS	☒				SP	308	TP	302	EE	4473	SEE	REF 15				
			☒			SP	308	TP	302	EE	4473	SEE	REF 9				
				☒		SP	308	SEE	REF 2								
12	SERVICE AREA	☒				SP	308	TP	302	EE	4473	WA	124	WA	124		
			☒			SP	308	TP	302	EE	4473	WA	124	WA	124		
				☒		SP	308	TP	302	EE	4473	GD	20L	GD	20L		

INTERIOR	HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 24	REV D

N.N. FORM N18-23

8300-40

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PAINTING SCHEDULE

LINE NO.	"D" DECK CON'T SPACE	DESCRIPTION TOP	 SIDE	 DK	 OTHER CONDITIONS	1ST. COAT MATL	 FORMULA	2ND. COAT MATL	 FORMULA	3RD. COAT MATL	 FORMULA	4TH. COAT MATL	 FORMULA	5TH. COAT MATL	 FORMULA	REMARKS	GEN NOTE
13	BATHS	☒				SP	308	TP	302	EE	4473	SEE	REF 15			ALSO SEE REF 17	
			☒			SP	308	TP	302	EE	4473	SEE	REF 9				
				☒		SP	308	SEE	REF 2								
14 (C13)	RADIO ROOM	☒				SP	308	TP	302	EE	4473	SEE	REF. 15				
			☒			SP	308	TP	302	EE	4473	SEE	REF. 9				
				☒		SP	308	SEE	REF 2								
15 (C13)	BATTERY LOCKER	☒				SP	308	TP	302	EE	4473	EF	110				
			☒			SP	308	TP	302	EE	4473	EF	110				
				☒		SP	308	TP	302	EE	4473	EG	110				

N.N. FORM N16-23

INTERIOR	HULL 613C & 614C	MARAD HULL NO. NN DWG NO. 8300-40	SHT NO. 25	REV D

8300-40

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PAINTING SCHEDULE

LINE NO.	NAV BRIDGE DECK SPACE	DESCRIPTION TOP	 SIDE	 DK	 OTHER CONDITIONS	1ST. COAT MATL	 FORMULA	2ND. COAT MATL	 FORMULA	3RD. COAT MATL	 FORMULA	4TH. COAT MATL	 FORMULA	5TH. COAT MATL	 FORMULA	REMARKS	GEN NOTE
1	NAVIGATION & CONTROL AREA & CHART ROOM AREA	☒				SP	308	TP	302	EE	4473	SEE	REF 16				
			☒			SP	308	TP	302	EE	4473	SEE	REF 10				
				☒		SP	308	SEE	REF 2								
2 Ⓒ13	~~RADIO ROOM~~	☒				~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~SEE~~	~~REF 16~~				
			☒			~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~SEE~~	~~REF 10~~				
				☒		~~SP~~	~~308~~	~~SEE~~	~~REF 2~~								
3 Ⓒ13	~~SPARE PARTS LKR~~	☒				~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~(LATER)~~					
			☒			~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~(LATER)~~					
				☒		~~SP~~	~~308~~	~~(LATER)~~									
4 Ⓒ13	~~BATTERY LOCKER~~	☒				~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~(LATER)~~					
			☒			~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~(LATER)~~					
				☒		~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~(LATER)~~					
5 Ⓒ13	STAIR TOWER	☒				SP	308	TP	302	EE	4473	SEE	REF. 16				
			☒			SP	308	TP	302	EE	4473	SEE	REF. 10				
				☒		SP	308	SEE	REF. 2								
6 Ⓒ13	OIL SKIN LOCKER	☒				SP	308	TP	302	EE	4473	SEE	REF. 16				
			☒			SP	308	TP	302	EE	4473	SEE	REF 10				
				☒		SP	308	SEE	REF. 2								
7	ELEVATOR MACH'Y SPACE	☒				SP	308	TP	302	EE	4473					APPLY FINISH COATS TO AREAS EXPOSED TO NORMAL VISION	
			☒			SP	308	TP	302	EE	4473						
				☒		SP	308	TP	302	EE	4473						
8 Ⓒ13	~~SERVICE AREA~~	☒				~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~WA~~	~~124~~	~~WA~~	~~124~~		
			☒			~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~WA~~	~~124~~	~~WA~~	~~124~~		
				☒		~~SP~~	~~308~~	~~TP~~	~~302~~	~~EE~~	~~4473~~	~~GD~~	~~20L~~	~~GD~~	~~20L~~		
9	DECK WC	☒				SP	308	TP	302	EE	4473	SEE	REF 16			ALSO SEE REF 17	
			☒			SP	308	TP	302	EE	4473	SEE	REF 10				
				☒		SP	308	SEE	REF 2								

N.N. FORM N15-23

INTERIOR	HULL 613C & 614C	MARAD HULL NO. 309 & 310	SHT NO. 26	REV D
		NN DWG NO. 8300-40		

8300-40

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PAINTING SCHEDULE

	LINE NO.	SPACE	DESCRIPTION TOP	SIDE	DK	OTHER CONDITIONS	1ST. COAT MATL	FORMULA	2ND. COAT MATL	FORMULA	3RD. COAT MATL	FORMULA	4TH. COAT MATL	FORMULA	5TH. COAT MATL	FORMULA	REMARKS	GEN NOTE
	1	FLAT KEEL				SEE NOTE B.11	SP	308	DB	201	DR	230	DM	230	DA	214	PRIOR TO SETTING ON KEEL BLOCKS	B1
B	2	KEEL TO 10' ABOVE BL				SEE NOTE B.11	SP	308	DB	201	DR	230	DM	230	DA	214		B5
	3	10' ABOVE BL TO 6" ABOVE LLL				SEE NOTE B.11	SP	308	DB	201	DR	230	DA	214	DA	214		B5
	4	6" ABOVE LLL TO RAIL					SP	308	TP	302	IZ	302	CP	3504	CB	4448		B7
C_{11}	5	VERTICAL STEEL SURFACES ABOVE UPPER DECK					SP	308	TP	302	IZ	302	DB	201	SW	—		
C_{10} D_1	6	WEATHER DECKS					SP	308	TP	302	IZ	302	DB	201	DB	201	6TH COAT "CN-237M" APPLY "DB-201" @ 1.5 MILS	L
C_{11}	7	OVERHEADS					SP	308	TP	302	IZ	302	DB	201	SW	—		
	8	FOUNDATIONS					SP	308	TP	302	IZ	302	CP	3504		FINISH TO MATCH SURROUNDING AREA		
	9	MASTS					SP	308	TP	302	IZ	302	DB	201	SW	—		
C_{11}	10	CARGO HATCH COAMINGS					SP	308	TP	302	IZ	302	DB	201	SW	—		
C_{10}	11	MISC DECK FITTINGS				SEE LINE 30	SP	308	TP	302	IZ	302	CP	3504	CB	4448		B2
	12	EXPOSED PARTS OF MAJOR POWERED DECK MACHINERY				UNPRIMED	SP	308	IZ	302	CP	3504	CG	3508			"SP-308" IS TO BE OMMITED WHERE ABRASIVE BLASTING IS NOT PERMITTED.	
						RECEIVED PRIMED BY VENDOR	EE	4473	CP	3504	CG	3508						
	13	RUDDER HORN				INTERIOR	IZ	302										
	14	OUTER STACK-INTERIOR				INCL EXT OF INNER STACK CASING	RA		RA		RA							
	15	OUTER-STACK-EXTERIOR					SP	308	TP	302	IZ	302	CP	3504	CB	4448		
C_{11}	16	CRANES					SP	308	TP	302	IZ	302	DB	201	SW	—		
	17	PIPING				NON-FERROUS	WP	117		FINISH TO MATCH SURROUNDING AREA								
C_{10}						STEEL-ABRASIVE BLAST	SP	308	TP	302	IZ	302	CP	3504	CG	3508		
						GALVANIZED	WP	117		FINISH TO MATCH SURROUNDING AREA								
						CRES	NO	PAINT										
C_7	18	RUDDER-INTERIOR					BC										FILL & DRAIN	B8
B	19	SEA CHESTS				SEE NOTE B.11	SP	308	DB	201	DR	230	DM	230	DA	214		
C_{10} A-1	20	ANCHORS				COATED BY VENDOR	CP	3504	CB	4448								
A-1	21	ANCHOR CHAINS				COATED BY VENDOR												B9
	22	LIFE BOATS					NO	PAINT										
	23	DAVITS					SP	308	TP	302	IZ	302	CP	3504	CB	4448		
C_{11} B	24	STANCHIONS				EXTERIOR	SP	308	TP	302	IZ	302	DB	201	SW	—		
C_{10}	25	STORM RAILING-PIPE (GALVANIZED & ALUM)					WP	117	SW	—								
C_{11}	26	STORM RAILING-PIPE STEEL					SP	308	TP	302	IZ	302	DB	201	SW	—		

N.N. FORM

EXTERIOR

HULL	MARAD HULL NO.	SHT NO.	REV
613C & 614C	309 & 310	27	D
	NN DWG NO. 8300-40		

8300-40

MICRO-MASTER® 105 mm
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PAINTING SCHEDULE

LINE NO.	SPACE	DESCRIPTION				1ST. COAT		2ND. COAT		3RD. COAT		4TH. COAT		5TH. COAT		REMARKS	GEN NOTE
		TOP	SIDE	DK	OTHER CONDITIONS	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA	MATL	FORMULA		
27	RUNNING LIGHTS				ILLUMINATED SURFACES OF RUNNING LIGHT SCREENS	SP	308	TP	302	EE	4473	B	104	B	104		
28	SWIMMING POOL					SP	308	EW	244	EB	244						
29	CATHODIC PROTECTION SYSTEM					DA	214									SEE REF 20	B4
(C10) 30	MISC DECK FITTINGS				ALUMINUM	WP	117	CB	4448								B2
					GALV	WP	117	CB	4448								
(C13) 31	EXTERIOR DECK GRATINGS				PRIMED BY VENDOR-CLEAN AS REQUIRED	TP	302	CP	3504	CG	3508				-		

N.N. FORM N16-23

EXTERIOR	HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 28	REV D

8300-40

MICRO-MASTER 105 mm

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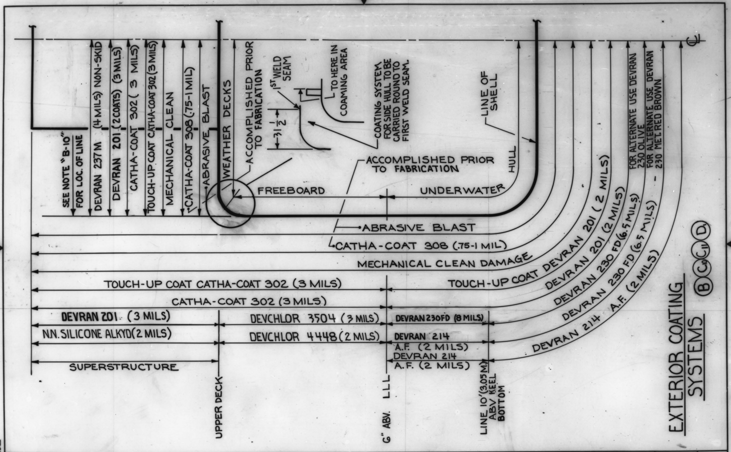
4X


EXTERIOR COATING SYSTEMS
B C C11 D
SEE NOTE "B-10" FOR LOC. OF LINE
DEVRAN 237M (4 MILS) NON-SKID
DEVRAN 201 (2 COATS) (3 MILS)
CATHA-COAT 302 (3 MILS)
TOUCH-UP COAT CATHA-COAT 302 (3 MILS)
MECHANICAL CLEAN
CATHA-COAT 308 (.75-1 MIL)
ABRASIVE BLAST
WEATHER DECKS
ACCOMPLISHED PRIOR TO FABRICATION
1ST WELD SEAM
31 1/2
TO HERE IN COAMING AREA
COATING SYSTEM FOR SIDE HULL TO BE CARRIED ROUND TO FIRST WELD SEAM.
ACCOMPLISHED PRIOR TO FABRICATION
LINE OF SHELL
HULL
FREEBOARD
UNDERWATER
FOR ALTERNATE USE DEVRAN 230 OLIVE
FOR ALTERNATE USE DEVRAN 230 MET. RED BROWN
ABRASIVE BLAST
CATHA-COAT 308 (.75-1 MIL)
MECHANICAL CLEAN DAMAGE
TOUCH-UP COAT CATHA-COAT 302 (3 MILS)
TOUCH-UP COAT DEVRAN 201 (2 MILS)
DEVRAN 201 (2 MILS)
CATHA-COAT 302 (3 MILS)
DEVRAN 230 FD (6.5 MILS)
DEVRAN 201 (3 MILS)
DEVCHLOR 3504 (3 MILS)
DEVRAN 230FD (8 MILS)
DEVRAN 230 FD (6.5 MILS)
N.N. SILICONE ALKYD (2 MILS)
DEVCHLOR 4448 (2 MILS)
DEVRAN 214 A.F. (2 MILS)
DEVRAN 214 A.F. (2 MILS)
DEVRAN 214 A.F. (2 MILS)
SUPERSTRUCTURE
UPPER DECK
6" ABV. LLL
LINE 10' (3.05 M) ABV KEEL BOTTOM

EXTERIOR	HULL 613C & 614C	MARAD HULL NO. 309 & 310	SHT NO. 29	REV D
		NN DWG NO. 8300-40		

N. N. FORM N 10-28

K+E PHOENIX TRACING CLOTH 77010

8300-40

MICRO-MASTER 105 mm

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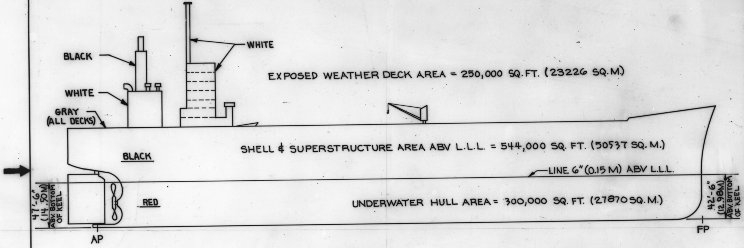
4X


BLACK
WHITE
WHITE
GRAY (ALL DECKS)
EXPOSED WEATHER DECK AREA = 250,000 SQ. FT. (23226 SQ. M.)
BLACK
SHELL & SUPERSTRUCTURE AREA ABV L.L.L. = 544,000 SQ. FT. (50537 SQ. M.)
LINE 6" (0.15 M) ABV L.L.L.
RED
UNDERWATER HULL AREA = 300,000 SQ. FT. (27870 SQ. M.)
47'-6" (14.50M) ABV. BOTTOM OF KEEL
42'-6" (12.98M) ABV. BOTTOM OF KEEL
AP
FP

EXTERIOR PROFILE & HULL FINISH COLORS

Ⓑ Ⓒ10

EXTERIOR	HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-41	SHT NO. 30	REV D

N.N. FORM N 18-22

K+E PHOENIX ® TRACING CLOTH 77010

8300-40

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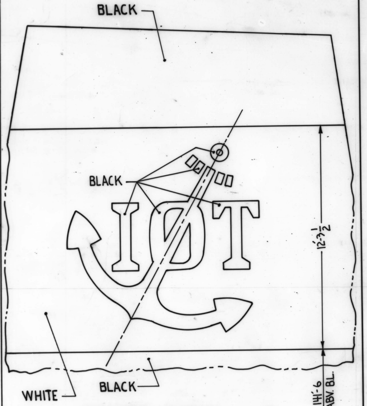
4X


BLACK
BLACK
IOT
12'-3 1/2
WHITE
BLACK
14'-6 ABV. BL.

FOR DIMENSIONS SEE REF. 26

C12

EXTERIOR- SHIP'S INSIGNIAS	HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 31	REV D

N. N. FORM N18-32

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LN NO.	PIPE SYSTEM	PIPE SIZE	INTERNAL SURF PREP & COATING	EXTERNAL SURF PREP & COATING
Ⓑ 1.	HYDRAULIC SYSTEMS	ALL	1. PICKLE AND WASH OUT AFTER FABRICATION 2. CLEAN AND COAT WITH COSMOLINE 1095 AND CAP ENDS.	1. PICKLE AND WASH OUT AFTER FABRICATION, TAPES ENDS AND SANDBLAST. 2. APPLY ONE COAT DEVRAN 308 AT 3/4 MIL DFT. 3. MECHANICAL CLEAN AND TOUCH-UP DAMAGED AREAS WITH DEVRAN 302 AFTER INSTALLATION. 4. APPLY ONE COAT DEVRAN 4473 AT 1-1/2 MILS DFT 5. APPLY COSMETIC COATS SAME AS SURROUNDING STRUCTURE.
2.	STEEL PIPE - SERVICE TEMP ABOVE 212°F REQUIRING INSULATION	ALL	1. PICKLE OR MECHANICAL CLEAN AND WASH OUT AFTER FABRICATION	1. SAME AS INTERNAL. 2. APPLY ONE COAT HEAT RESISTANT ALUMINUM PAINT. 3. BEFORE INSULATING, APPLY A SECOND COAT OF HEAT RESISTANT ALUMINUM PAINT.
3.	STEEL PIPE - SERVICE TEMP ABOVE 212°F NOT INSULATED (EXCEPTING HEATING COILS)	ALL	1. PICKLE OR MECHANICAL CLEAN AND WASH OUT AFTER FABRICATION	1. SAME AS INTERNAL 2. APPLY ONE COAT HEAT RESISTANT ALUMINUM PAINT.. 3. AFTER INSTALLATION, APPLY A SECOND COAT OF HEAT RESISTANT ALUMINUM PAINT.
Ⓑ 4.	STEEL PIPE - SERVICE - TEMP BELOW 212°F NOT INSULATED	ALL	1. PICKLE OR MECHANICAL CLEAN AND WASH OUT AFTER FABRICATION.	1. SAME AS INTERNAL. 2. APPLY ONE COAT DEVRAN 302 AT 2 MILS DFT 3. TOUCH-UP DAMAGED AREAS WITH DEVRAN 302 AFTER INSULATION. 4. APPLY ONE COAT DEVRAN 4473 AT 1-1/2 MILS DFT. 5. APPLY COSMETIC COATS SAME AS SURROUNDING STRUCTURE
5.	STEEL PIPE - SERVICE TEMP BELOW 212°F REQUIRING INSULATION IN COFFERDAMS AND VOIDS (EXCEPT LOWER PIPE TUNNEL)	ALL	1. PICKLE OR MECHANICAL CLEAN AND WASH OUT AFTER FABRICATION	1. SAME AS INTERNAL. 2. APPLY ONE COAT DEVRAN 302 AT 2 MILS DFT
(C_8) Ⓑ 6.	STEEL PIPE - IN BILGE AREAS	ALL	1. PICKLE AND WASH OUT AFTER FABRICATION	1. SAME AS INTERNAL. 2. APPLY ONE COAT DEVRAN 244 HS. (ORANGE) OR DEVRAN 201. 3. TOUCH-UP DAMAGED AREAS WITH DEVRAN 244 HS OR DEVRAN 201 AFTER INSULATION. 4. APPLY ONE COAT DEVRAN 244 HS (RED) OR DEVRAN 230 FD

NOTES:

1. FERROUS PIPING COMPONENTS SUCH AS VALVES AND STRAINERS WHICH ARE COATED BY THE VENDOR WITH A RUST PREVENTATIVE PRIMER SHALL BE PAINTED AS FOLLOWS:
   - (a) IN PIPE TUNNEL AND BILGE AREA, APPLY A TIE COAT PRIMER AND A FINISH COAT TO MATCH THE SURROUNDING AREA
   - (b) IN SALT WATER TANKS, CLEAN AND APPLY SAME COATING AS BALLAST SYSTEM
   - (c) IN ALL OTHER AREAS, APPLY TWO COSMETIC COATS OVER VENDOR PRIMER TO MATCH SURROUNDING AREA
2. NON-FERROUS PIPING AND COMPONENTS NEED NOT BE PAINTED.
3. VALVE ACTUATORS IN SALT WATER TANKS, PIPE TUNNEL AND BILGE AREA SHALL BE LEFT AS COATED BY VENDOR.
4. Ⓑ ABRASIVE BLASTING MAY BE USED AS AN ALTERNATIVE TO THE SURFACE PREPARATION SPECIFIED ABOVE.

PAINTING SCHEDULE - PIPING INFO (A-1)	HULL 613C & 614C	MARAD HULL NO. 309 & 310 NN DWG NO. 8300-40	SHT NO. 32	REV D

N. N. FORM N 18-22

K•E PHOENIX ® TRACING CLOTH 77010

8300-40

MICRO-MASTER® 105 mm

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